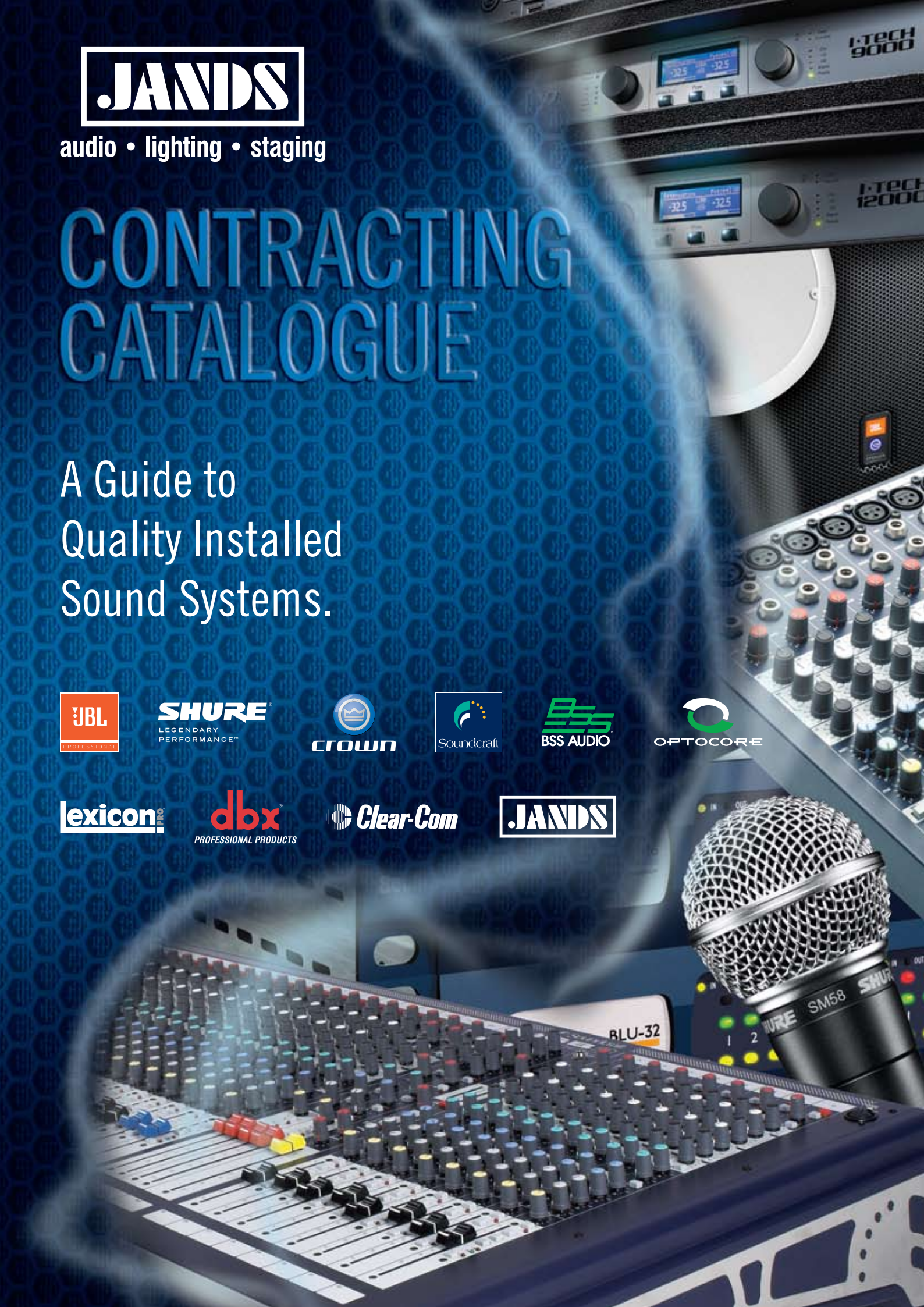




audio • lighting • staging

# CONTRACTING CATALOGUE

A Guide to  
Quality Installed  
Sound Systems.





## A Guide to Quality Installed Sound Systems

### Welcome,

Jands are excited to bring you the first edition of our Audio Contracting Catalogue. This publication is structured to assist you in the design of high quality everyday audio systems, suiting a wide range of budgets, and meeting the specific requirements for your customers and their venues and establishments.

The printed catalogue showcases contracting specific products as well as tech tips and relevant reference information. Keep in mind this catalogue is not a complete listing of all products in our portfolio. It is a selection of product we feel would suit the majority of your projects. If you can't find what you need in here please just contact us and we will help you find your solution.

In addition to the catalogue, we have produced an accompanying CD containing a wealth of supporting information to assist you in the design of your systems, from white papers to technical application guides, all specific to the contracting market. We have also provided all the specification sheets and software for each relevant product in each category, plus current tunings for our speaker management systems and amplifiers when used with JBL loudspeaker systems. Please be aware that these documents and downloads are all current as at April 2009. For up to date versions please go to the Support section of the Jands website where you will find links to the varying information you may need.

Don't forget our Technical Resource Group (TRG) is here to aid you with any design requirements, questions or general assistance you may require, so please do not hesitate to contact us.

If there is no CD attached here when you receive this catalogue please contact Jands on [marketing@jands.com.au](mailto:marketing@jands.com.au) or 02 9582 0909 for a replacement.



If you want more information on any of these product categories then please visit [www1.jands.com.au/products](http://www1.jands.com.au/products). We have a comprehensive website that features not only the products you see listed in this catalogue, but also explanations of how equipment works and glossaries of terms you may find helpful. You can also visit [www1.jands.com.au/support](http://www1.jands.com.au/support) and find technical support materials and links to various supplier help guides.



## Wired/Wireless Microphones & DI's

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LEGENDARY  
PERFORMANCE™

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**Clear-Com**

Wired microphones are the cornerstone of any sound system. Qualifying your customer's needs and budget will start you in the right direction for microphone selection. Shure's product philosophy is to provide good, better and best ranges for vocal and instrument microphones, starting with the "PG Series", progressing to the "SM Series" and culminating with the "Beta Series". For permanent installations for speech or conferencing uses, select from the Shure "MX Series". This is a comprehensive range of gooseneck and boundary type mics for podiums, lecterns, boardroom tables and even wireless boundary mics for quick turnaround of conference facilities. Recognised as the industry's leading microphone manufacturer, no other microphone company has the Shure depth of engineering horsepower and industry knowledge (over 80 years of experience). The SM58 alone has a 40 year heritage in the professional audio industry and is still the global standard in hand held microphones.

## Vocal Microphones



### Shure PG48

Basic entry level hand held for speech or karaoke.

- 70Hz-15kHz
- Dynamic
- Cardioid



### Shure PG58

Quality entry level hand held for speech or lead/backing vocal.

- 60Hz-15kHz
- Dynamic
- Cardioid



### Shure SM58

Quality mid level hand held for speech, lead/backing vocal or harmonica.

- 50Hz-15kHz
- Dynamic
- Cardioid



### Shure SM87A

High quality mid level hand held for lead/backing vocal.

- 50Hz-20kHz
- Condenser
- Super Cardioid



### Shure SM10A

Mid level head worn for lead/backing vocal.

- 50Hz-15kHz
- Dynamic
- Cardioid



### Shure Beta58A

High performance hand held for speech or lead/backing vocal.

- 50Hz-16kHz
- Dynamic
- Super Cardioid



### Shure Beta87C

Premium performance hand held for lead/backing vocal.

- 50Hz-20kHz
- Condenser
- Cardioid



### Shure Beta54

High performance head worn for lead/backing vocal.

- 50Hz-20kHz
- Condenser
- Super Cardioid

## Instrument Microphones



### Shure PG57

Basic entry level instrument mic for guitar, brass or saxophone.

- 50Hz-15kHz
- Dynamic
- Cardioid



### Shure PG81

Quality entry level instrument mic for acoustic guitar, piano, cymbals, strings, woodwind or ensembles.

- 40Hz-18kHz
- Condenser
- Cardioid



### Shure PG52

Quality entry level instrument mic for kick drum or bass amp.

- 30Hz-13kHz
- Dynamic
- Cardioid



### Shure PG56

Quality entry level instrument mic for snare, rack/floor toms or percussion.

- 50Hz-15kHz
- Dynamic
- Cardioid



### Shure SM57

Quality mid level instrument mic for guitar/bass amps, brass, saxophone, harmonica, snare/tom or conga.

- 40Hz-15kHz
- Dynamic
- Cardioid



### Shure SM81

Quality mid level instrument mic for acoustic guitar/bass, strings, piano, woodwind, cymbals, orchestra or recording.

- 20Hz-20kHz
- Condenser
- Cardioid



### Shure SM89 Shotgun

High quality instrument/vocal mic for overhead or proscenium.

- 60Hz-20kHz
- Condenser
- Hyper cardioid
- High directionality
- Long distance



### Shure Beta57A

High performance instrument mic for guitar/bass amps, acoustic guitar, brass, saxophone, snare/toms or conga.

- 50Hz-16kHz
- Dynamic
- Super Cardioid



### Shure Beta52A

High performance instrument mic for kick drum, bass amp or acoustic bass.

- 20Hz-10kHz
- Dynamic
- Super Cardioid



### Shure DMK57-52 Drum Mic Kit

Quality mid level drum mic kit.

- 3 x SM57
- 1 x Beta 52
- 3 x A56D Drum Mounts in Protective carry case

## Installation Microphones

### Gooseneck

#### Shure Microflex MX400 Series

For lecterns, desktops, podiums etc.

- 5", 10", 12" & 18" versions
- 50Hz-17kHz
- Condenser
- Optional – Cardioid, Super Cardioid or Omni
- Speech
- Boardrooms, Classrooms, Conferencing, Houses of Worship



### Overhead

#### Shure Microflex MX202

For overhead drops on stages for choir, speech or performance mic'ing.

- 4" Flexible Gooseneck + 9m Cable
- 50Hz-17kHz
- Condenser
- Optional – Cardioid, Super Cardioid or Omni
- Speech
- Schools, Theatre, Houses of Worship
- Black or white



### Boundary

#### Shure Microflex MX391

Basic tabletop conferencing mic. Black or white, with or without inline preamp.

- 50Hz-17kHz
- Condenser
- Cardioid, Super Cardioid or Omni
- 3.6m cable
- Speech
- Boardrooms, Classrooms, Conferencing, Houses of Worship



#### Shure Microflex MX392/393

Advanced tabletop conferencing mic. Black, LED Indicator, Preamp, Programmable Switch & Logic (MX 392 only).

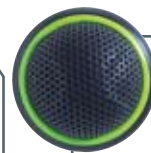
- 50Hz-17kHz
- Condenser
- Cardioid, Super Cardioid or Omni
- 3.6m cable
- Speech
- Boardrooms, Classrooms, Conferencing, Houses of Worship



#### Shure Microflex MX395

Through surface mount conferencing mic. Low profile, 32mm dia, low cut filter, XLR, Bi colour LED (optinal black & silver only).

- 50Hz-17kHz
- Condenser
- Cardioid, Bi-Directional or Omni
- Black
- Silver
- White (Omni only)
- 3.6m cable
- Speech
- Boardrooms, Classrooms, Conferencing, Houses of Worship



#### Shure Microflex MX396

Multi directional tabletop conferencing mic. Dual or tri elements, Bi colour LED indicator & configurable mute switch.

- 50Hz-17kHz
- Condenser
- Cardioid
- 6.1m cable
- Speech
- Boardrooms, Classrooms, Conferencing, Houses of Worship



#### Shure Microflex MX690

Wireless tabletop conferencing mic. Compatible with Shure SLX series wireless systems, battery gauge, programmable for press-to-talk, press-to-mute or toggle.

- 50Hz-17kHz
- Condenser
- Cardioid
- Speech
- Boardrooms, Classrooms, Conferencing, Houses of Worship
- Requires SLX receiver



### tips guide

For budget conscious installations that require superior radio performance you can't go past the Shure SLX range of radio microphones.

see page 

### TECH-TIPS

#### How do I stop my microphone from feeding back?

Feedback is caused by a complex interaction between the sound system, the room, and the microphone. Higher quality mics generally exhibit better feedback rejection. Directional mics such as Cardioid or Super Cardioid types are much better than Omni Directional types.

The following rules of thumb generally apply:

- **Try to keep mics behind loudspeaker locations;**
- **Try to minimise talker to microphone distance and maximise mic to loudspeaker distance;**
- **Only use as much mixer channel gain as required.**

Equalisers and Digital Feedback Reducers when used properly can also help.

## Industrial/Commercial Microphones



**Shure Handheld 527B**  
Handheld, push-to-talk for communication, paging and PA applications.

- 300Hz-5kHz
- Dynamic
- Omnidirectional



**Shure Desktop 522**  
Dual impedance, push-to-talk for paging and talkback applications.

- 60Hz-11kHz
- Dynamic
- Cardioid



**Shure Gooseneck 503BG**  
Compact, low background noise for paging, talkback and close-talk applications.

- 100Hz-7kHz
- Dynamic
- Cardioid



**Shure Handheld 515SDX**  
Rugged push-to-talk for radio communications, dispatch and paging.

- 80Hz-15kHz
- Dynamic
- Cardioid

### How do I install remote wireless microphone antennas?

Remote antennas; multi-coupling receivers; multi room wireless; it can all seem a bit daunting. Shure Microphones, one of the worlds leading manufacturers of wireless systems, have put together an excellent publication on all things antenna related. Check out the "Shure Effective Antenna Setup" guide. It should have all the answers you are looking for. You will find the document in the "Microphones" folder of the "Educational Information" section of our companion CD located inside the front cover.

TECH-TIPS

### Which antenna cable is best for wireless microphone systems?

All coaxial antenna cables are inherently lossy. The amount of signal loss increases with frequency (higher frequencies = more loss), and length of the cable (longer length = more loss). Given that the general concept is to minimise signal loss, the best option is to use the lowest loss cable possible, and keep the cable runs as short as possible. However low loss cables are generally more expensive, and harder to work with. So a compromise is required.

Table 1. lists several 50 ohm coaxial cables commonly used with wireless microphone systems. The 'normal' cable supplied with most wireless systems is RG-58/U, which has the highest loss of all. RG-58/U is only suitable for very short runs.

Table 1.

Cable Type	Diameter (mm)	Loss dB/30m @ 1GHz	% Loss (per 30m @ 1GHz)
RG-58/U	4.9	16.7	98
RG-8/X	6.2	11.2	92
RG-8/U	10.3	8.8	87
RG-213/U	10.3	8.8	87

### So what is the maximum length I can run?

There is no easy hard & fast answer to this question. If your system has plenty of head room, i.e. your transmitter is physically close to the receiving antenna, you can afford to lose a fair bit of signal on the coax before system performance deteriorates. However if you do not have much system headroom you need to minimise all losses.

As a general rule it is recommended that selecting a cable so that cable loss is maintained at less than 10dB. This translates to the following distances at 1GHz:

**RG-58/U = 17m / RG-8/X = 26m / RG-8/U or RG-213 = 33m**

Distances beyond this require careful system design and possibly in-line amplification. But that is a topic for another day. Shure supply pre-terminated coaxial cable assemblies in various lengths, conveniently utilising lower loss cable types for the longer runs. Shure part numbers are detailed in Table 2.

Table 2.

Stock Code	Description
UA802	BNC-BNC, RG58C/U type, 2 foot (0.6m)
UA806	BNC-BNC, RG58C/U type 6 foot (2m).
UA825	BNC-BNC, RG8X/U type 25 foot (7.5m).
UA850	BNC-BNC, RG8X/U type, 50 foot (15 m)
UA8100	BNC-BNC, RG213 type, 100 foot (30m)

TECH-TIPS



When freedom of movement is required a wireless microphone system is a must. They remove the tripping hazard of cables across a stage or floor and accommodate the ability to move amongst a group of people and share the mic, interview style. In conference type applications there are also wireless boundary microphones for boardroom tables which allow for rapid room configuration turnaround time or eliminate the need to drill holes in expensive boardroom tables.

## Wireless Systems

### Shure PG

Dual transmitter & receiver system. Ideal for small school and church applications.

- Entry level Dual Receiver
- Up to 4 compatible channels (2 receivers)
- Internal Antenna\*
- Diversity
- Available in any combination of Hand held, Lapel or Headset



### Shure SLX

Quality professional entry level systems.

- Frequency agile
- Up to 12 systems per band
- True diversity
- Hand held or Body pack
- ½ Rack receiver
- Patented Companding
- Multiple capsule models available



### Shure ULX

High quality professional level systems.

- Frequency agile
- Up to 20 systems per band
- True diversity
- Hand held or Body pack
- ½ Rack receiver
- Patented Companding
- Multiple capsule models available



### Shure UHF-R

Premium quality professional level systems.

- Frequency agile
- Up to 48 systems per band
- True diversity
- Networkable control & monitoring
- Hand held or Body pack
- Single or dual receiver
- Patented Companding
- Multiple capsule models available



\* Please note that PG series receivers use INTERNAL antennas and as such have no external antenna connections. Remote location of antennas is not possible. These receivers should not be housed in metal equipment racks and should be used in "line of sight" applications only.



### Wireless Workbench 5.0.1 Software Scan. Plan. Command.

Wireless Workbench 5 from Shure is your wireless command centre for frequency coordination of any Shure Wireless product and networked control of Shure UHF and UHF-R® series wireless systems. Now compatible with both Windows Vista and Mac OS X (including 10.5 Leopard).

### TECH-TIPS

#### Can I use two wireless transmitters with the one wireless receiver?

Basically No. Two transmitters can not operate on the same frequency without causing mutual interference. In the case of a customer buying a handheld and bodypack combo system, it is important they use EITHER the hand-held, OR the bodypack transmitter one at a time. Never BOTH simultaneously to a single channel receiver.

## Wireless Accessories

### SLX / ULX / UHF-R



#### Shure UA221 Passive Antenna Splitter/Combiner Kit

Antenna Splitter/Combiner kit, Passive, for SLX4, ULXS4, ULXP4, U4S, U4D, UR4S and UR4D.

#### Shure UA844 Antenna Distribution System

Antenna Splitter and Power Distribution System for receivers, four-way Active Antenna Splitter, Wideband UHF & External power supply.



#### Shure UA860SWB Passive Omnidirectional Antenna

One half Wave Omnidirectional Wideband Antenna for use with SLX, ULX, UC, UHF and UHF-R Wireless Systems.



#### Shure UA870WB UHF Wideband Antenna

Active directional, UHF Wideband (470-900MHz) for ULXP, ULXS, UR4S and UR4D receivers or UA844, UA845 Antenna Distribution Systems.



#### Shure WA615M ID Rings

ID Rings, Multi-coloured handheld transmitter ID Rings for T, UT, LX, ULX, and UC.

#### Shure UA440 Front Mount Antenna rack kit

Includes four 2-foot BNC-BNC Coaxial cables and Four Bulkhead Adapters. Requires full rack space.



#### Shure UA845 Wideband UHF (470-952 MHz)

Active Antenna and Power Distribution System, Five-way, Wideband UHF (470-952 MHz), Internal switching power supply.

#### Shure WA580B Black Cloth Pouch

Black cloth pouch for UR1 bodypack transmitter. Also available in white.



## DI's



**dbx dB10 Passive DI**

- Rugged design
- Stackable chassis
- Gold-plated Neutrik® XLR Connector
- Hi-Z ¼" input jack
- Parallel ¼" thru jack
- Transformer isolated
- Shielded custom dbx transformer
- Balanced XLR Lo-Z output
- 3-Way 0/20/40 dB pad
- Flat/High-cut filter switch
- Polarity invert switch
- Ground lift switch



**dbx dB12 Active DI**

- Rugged design
- Stackable chassis
- Gold-plated Neutrik® XLR Connector
- Hi-Z ¼" input jack
- Parallel ¼" thru jack
- Transformer isolated
- Shielded custom dbx transformer
- Balanced XLR Lo-Z output
- 3-Way 0/20/40 dB pad
- Flat/ High-cut filter switch
- Polarity invert switch
- Ground Lift Switch
- Phantom powered
- Phantom power LED
- 18 – 48V Operation
- Low-Noise active circuitry



**BSS AR133 Active DI**

- Switchable attenuation 0 dB, 20 dB & 40 dB
- Can drive signals up long cable lengths
- Phantom or battery powered
- Automatic switch to battery if phantom power fails
- Parallel Link Jack output to feed amplifiers directly
- Parallel XLR input for converting unbalanced outputs to balanced lines

## Goosenecks, Mounts and Adaptors



**Shure A12/A12B Mounting Flange**

- Flange - 5/8"-27
- Threaded
- Matte silver or black



**Shure A13HD and A13HDB Heavy Duty Mounting Flange**

- Flange
- Matte silver or black



**Shure A202BB Microphone Desk/ Table Stand**

Allows the Shure MX202 overhead microphone to be used as a desktop microphone.



**Shure A400SM, A400XLR, A400SMXLR and A99SMA Shock Mounts**

Accessories that allow permanent installation of a quick release shock mount. For use with a wide variety of gooseneck microphones.



**Shure A412B Desktop Base**

Allows gooseneck mics to be quickly mounted when permanent installation is impractical. Angled XLR input connector maintains a low profile. Ample room for custom circuitry. Includes cable.



**Shure G6A Gooseneck Side Vent**

- 6-inch (15 cm)
- Chrome only



**Shure G12 Gooseneck**

- 12 inch (30 cm) gooseneck
- Comes in chrome or black
- Female XLR connector optional

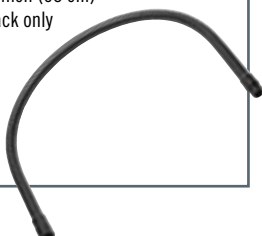


**Shure G18-CN Gooseneck with XLR Connector**

- 18 inch (46 cm) gooseneck
- Comes in chrome or black
- With female XLR connector

**Shure G27B Gooseneck**

- 27 inch (68 cm)
- Black only



**Shure S37A Desk Stand**

Suitable for MX series.



**Shure S39A Vibration-Isolation Desk Stand**

Suitable for MX series.



**Shure A55M Isolation Mount Shock Stopper**

Isolation mount/swivel adapter, full mount, for SM57, SM58, Beta57A, Beta58A, Beta87C or any Shure Tapered handle mic.



## Quick Fix Adaptors & Pre Amps



### Shure A85F Line Matching Transformer

Economy low to high-impedance microphone matching transformer provides 24 dB of voltage gain and may be used in reverse.



### Shure A95U Line Matching Transformer

Reversible transformer matches low or high-impedance microphones to high or low-impedance inputs. The transformer permits use of very long microphone cables with either low or high-impedance microphones.



### Shure A95UF Line Matching Transformer

Completely reversible transformer matches low-impedance microphones to high-impedance inputs or high-impedance microphones to low-impedance inputs. Permits use of very long microphone cables with either low or high-impedance microphones.



### Shure A15AS Switchable Inline Attenuator

Used to prevent low-impedance microphones and high-output condenser microphones from overloading low-impedance inputs in high sound pressure level applications. Switchable between 15/20/25 dB.



### Shure A15HP High Pass Filter

- 100Hz HPF at 12 dB per octave.
- Reduces unwanted noise in microphone signals.



### Shure A15LA Line Input Adapter

Provides a balanced bridging input with 50 dB attenuation. Use the A15LA to connect high-level line or Aux outputs to low-impedance microphone inputs.



### Shure A15BT Bridging Transformer

Matches, bridges, or isolates balanced and unbalanced devices of different impedances and levels.



### Shure A15RF In-Line RF Interference Attenuator

Provides all types of balanced audio systems with greatly improved immunity to Radio Frequency Interference (RFI).



### Shure A15TG Microphone Level Tone Generator

The Shure A15TG tone generator is a battery-powered 700Hz signal source that can be used to troubleshoot low-impedance, balanced line microphone inputs.



### Shure A120S In-Line Switch

Can be used to add an on/off, push-to-talk, cough button, or transmitter-relay keying function to a microphone or other device.



**JANDS**  
**ReadyRack**

**Jands ReadyRack.**

A great new addition to the Jands 19 inch rack range. Designed specifically for A.V installers to reduce time and save money. The **ReadyRack** is as the name implies, **READY** to go.

It arrives on-site boxed ready to go with all the necessary accessories required for a quick, neat and efficient install. The adjustable equipment supports make it **READY** for one person to install heavy equipment easily.

The **Jands ReadyRack** is available in two sizes **13RU** (JND-RR13S) and **19RU** (JND-RR19S) both being 470mm deep.

Mixers come in many shapes and sizes which are relative to the application. Live mixing consoles are larger in comparison to paging/BGM mixers which can fit in one rack space. Deciding on a mixer can be confusing so make sure you list your requirements and then allow that little bit extra to cover any curve balls that may be thrown. It is always better to have too much than not enough. Soundcraft are celebrating 35 years of mixer design, innovation and construction. No other manufacturer has the experience and know-how, no other manufacturer is Soundcraft.

## Digital Consoles

### Soundcraft Vi Series

64 or 96 Mono inputs into 35 outputs (Vi6), 48 Mono inputs into 27 outputs (Vi4). Pairs of Mono inputs can be linked to create Stereo channels.

#### Busses

32 Grp/Aux/Matrix (Vi6), 24 Grp/Aux/Matrix (Vi4) plus main LCR Mix and LR Solo busses (maximum of 16 Matrix outputs can be configured).

#### Insert Points

24 insert send/return pairs can be configured (using available I/O) and assigned to any of the input or output channels.

#### Direct Outputs

All input channels can have direct outputs in addition to their internal bus routing, assuming sufficient I/O is available (eg optical MADI card).

#### Local Rack Inputs

- 16 Analogue line inputs
- 3 Analogue Mic/Line inputs
- 1 Talkback mic input (mounted on control surface)
- 8 pairs of AES/EBU inputs (=16 channels)
- 64ch optical MADI In

#### Local Rack Outputs

- 16 Analogue line outputs
- 8 pairs of AES/EBU outputs (= 16 channels)
- Dual solo busses, A (L, C, R) and B (L, R)
- TB line output



Soundcraft  
**Vi SERIES™**  
DIGITAL LIVE SOUND CONSOLES

#### Stagebox Inputs

- Stagebox inputs: 64 (Vi6), 48 (Vi4) analogue Mic/Line inputs (with remote gain control, 48V and pre-A-D 80Hz HPF).
- Optional 4 x AES/EBU input card (replaces 8 x mic inputs)

#### Stagebox Outputs

- Stagebox outputs: 32 (Vi6), 24 (Vi4) analogue line outputs
- Optional 4 x AES/EBU output card (replaces 8 x line outputs)

#### General

- Dual redundant power supplies on Control Surface, Stage Rack and Local Rack



### Soundcraft Si Series

- 48 or 64 Mono inputs
- 4 Stereo inputs
- Left/Center/Right outputs
- 24 bus outputs (Aux/Group)
- 8 Matrix outputs
- 12 VCAs
- 8 Mute Groups
- 4-band fully Parametric EQ with high and low cut filters.
- On-board dynamics
- Four independent Lexicon processors
- A physical output and meter for every bus.
- 8 assignable analogue inserts for additional outboard equipment

Soundcraft  
**Si SERIES™**  
DIGITAL LIVE SOUND CONSOLES

- 4 expansion slots for AES/EBU and/or MADI
- HiQNet connectivity
- Dual redundant power supply option

**Contracting HUB** is a new addition to Jands portfolio of e-newsletters, covering audio, lighting and staging needs of the contracting market. Focusing on the specific needs of **Contractors**, **Contracting HUB** brings you bi-monthly updates on new and existing products through our “What’s Hot” section; offers a range of handy “Geek Files” (compiled by our very own Technical Resource Group for your specific needs); keeps you up to date with who’s doing what in our “Out & About” features; and feeds through regular industry news. *Don’t be left out of the loop! Subscribe to Contractor HUB and stay up-to-date with all the developments in the contracting world.*

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**CONTRACTING**  
*Hub*  
powered by **JANDS**



## Analogue Consoles

### Soundcraft LX7ii

- Mid size
- 16, 24 or 32 channel
- 4 groups
- 6 aux
- GB30 preamps & EQ
- 4 band EQ
- 100mm faders
- Direct outs
- Integral power supply



### Soundcraft GB2

- Full size
- 16, 24 or 32 channel
- 4 groups
- 6 aux
- 6 x 2 matrix
- 2 stereo channels
- GB30 Preamps & EQ
- 4 band EQ
- 100mm faders
- Direct outs
- Integral power supply + external power link



### Soundcraft GB4

- Full size
- 12, 16, 24, 32 & 40 channel
- 4 groups
- 8 aux
- 7 x 4 matrix
- 2 stereo channels
- 2 stereo returns
- GB30 Preamps & EQ
- 4 band EQ
- 4 mute groups
- 100mm faders
- Direct outs
- Integral power supply + external power link



### Soundcraft GB8

- Full size
- 16, 24, 32, 40 & 48 channel
- 8 groups
- 8 aux
- 11 x 4 matrix
- 4 stereo channels
- 4 stereo returns
- GB30 Preamps & EQ
- 4 band EQ
- 4 mute groups
- 100mm faders
- Direct outs
- Integral power supply + external power link



### Soundcraft MH2

- Full size
- 24, 32, 40 & 48 channel
- 8 groups
- 8 VCA's
- 10 aux
- LCR panning
- 11 x 4 matrix
- 4 Mic/Line stereo channels
- 4 stereo returns with 3 band EQ
- MH4 Preamps & EQ
- 4 band all swept EQ
- 6 mute groups
- 100mm faders
- Direct outs
- Integral power supply + external power link



### Soundcraft MH3

- Full size
- 24, 32, 40, 48 & 56 channel
- 8 groups
- 8 VCA's
- 12 aux
- LCR panning
- 12 x 4 matrix
- 4 Mic/Line stereo channels
- 8 stereo returns with 3 band EQ
- MH4 Preamps & EQ
- 4 Band all swept EQ (parametric High Mid & Low Mid freq)
- 8 mute groups
- 100mm faders
- Direct outs
- Optional meter bridge
- Integral power supply + External power link



### Soundcraft MH4

- Full size
- 24, 32, 40, 48 & 56 channel
- 8 groups
- 8 VCA's
- 12 aux
- LCR panning
- 20 x 8 matrix
- 4 Mic/Line stereo channels
- 4 stereo returns with 3 band EQ
- MH4 Preamps & EQ
- 4 band all swept EQ (parametric High Mid & Low Mid freq)
- 8 mute groups
- 100mm faders
- Direct outs
- Optional meter bridge
- Integral power supply + External power link



The Soundcraft LX7ii is one of the best-featured live mixing consoles available at its' price point. 16, 24 or 32 channels, with 7-bus architecture, now that's smart.

**tips  
guide**

## Rack Mount & Utility Mixers

### Soundcraft EPM

- 6, 8, 12 mono channels
- 2 stereo channels
- GB30 Preamps
- 3 band swept mid EQ
- 2 aux
- Inserts on all mono channels & outputs
- 10 LED metering
- 48v Phantom power
- Rack mount optional



### Soundcraft EFX

- 8, 12 mono channels
- 2 stereo channels
- GB30 Preamps
- 3 band swept mid EQ
- 1 FX send
- 1 aux
- 32 Lexicon FX on board
- Inserts on all mono channels & outputs
- 10 LED metering
- 48v Phantom power
- Rackmount optional



### Soundcraft MPMi

- 12, 20 mono channels
- 2 stereo channels
- 2 groups
- GB30 Preamps
- 3 band swept mid EQ
- 3 aux
- Inserts on all mono channels & outputs
- Monitor outputs
- 10 LED metering
- 48v Phantom power
- Rack mount included for 12ch (optional for others)



### Soundcraft MFXi

- 8, 12, 20 mono channels
- 2 stereo channels
- 2 groups
- GB30 Preamps
- 3 band swept mid EQ
- 32 Lexicon FX on board
- 3 aux
- Inserts on all mono channels & outputs
- Monitor outputs
- 10 LED metering
- 48v Phantom power
- Rack mount included for 12ch (optional for others)



### Soundcraft GB2R-16 & GB2R-12.2

- 19" rackmount console
- 16 channel version, with 16 mono inputs, stereo mix and mono sum outputs
- 12.2 channel version, with 12 mono inputs and 2 stereo inputs, 1 stereo sub group, mix and mono sum outputs
- 6 aux outputs
- Rotatable input panel
- 2 full feature stereo inputs (GB2R-12.2)
- GB30 mic pre's and EQ
- Switchable + 48V Phantom power
- 100Hz Hi-pass filter
- Direct outputs
- 100mm faders

- Stereo mix and mono sum outputs
- Record output



### Soundcraft FX16ii

- 26 inputs
- 16 mono channels
- 4 stereo returns
- 2 groups
- 32 Lexicon FX on board
- Direct outputs
- Inserts on all mono channels & mix outs
- 3 Band swept mid EQ
- 100Hz HP filter
- 48V phantom power
- Channel mutes
- 10 LED metering
- Separate mono sum output
- Integral universal power supply



**tips  
guide**

The Soundcraft FX range of utility mixers is great for small school and church applications. With on board Lexicon effects these mixers have all the facilities required for that budget and are rack mountable.



## Commercial Mixers

### Crown 14M / 28M

- 14M - 4 Mic/Line inputs
- 14M - 1 output
- 28M - 8 Mic/Line inputs
- 28M - 2 output
- Balanced Phoenix-type mic/line inputs
- Bass & treble per channel
- Priority muting
- 24v DC operation
- Rack or shelf mount
- Three-Year, No-Fault Warranty



### Shure SCM262 Stereo Mixer

Ideal for applications requiring integration of microphones with stereo replay devices.

- Two balanced mic inputs
- 3 x stereo line inputs
- 1 x stereo output
- Master BASS and TREBLE EQ
- Jukebox mute function



### Shure SCM268 Transformer Balanced Microphone Mixer

Ideal for applications requiring integration of microphones to a mono balanced output.

- 4 x Transformer balanced microphone inputs
- 1 x Transformer balanced output (mic/line switchable)
- 6 segment LED output meter



### Crown 135MA

Ideal for small paging, background music, and music-on-hold.

- 3 inputs – 1 mic/2 line
- 1 x 35W @ 8Ω/70.7/100v
- Priority muting
- Three-Year, No-Fault Warranty



### Crown 160MA

Ideal for small paging, background music, and music-on-hold.

- 4 inputs – 1 mic/3 line
- 1 x 60W @ 8Ω/70.7/100v
- Priority muting
- Three-Year, No-Fault Warranty



### Crown 180MA

Ideal for medium paging, background music, and music-on-hold.

- 4 mic/line inputs
- 1 x 80W @ 4Ω/70.7/100v
- Phoenix type connectors
- Priority muting



### Crown 1160MA

Ideal for large paging, background music, and music-on-hold.

- 4 mic/line inputs
- 1 x 160W @ 4Ω/70.7/100v
- Phoenix type connectors
- Priority muting



### Crown 280MA

Ideal for large paging, background music, and music-on-hold.

- 8 mic/line inputs
- 2 x 80W @ 4Ω/70.7/100v
- Any input to either output
- Phoenix type connectors
- Priority muting



# Jands is the Australian distributor for Optocore.

*Fibre – Optic Network for Audio, Data and Video*

Specialist in optical fibre network solutions, capable of transporting audio, video, data & world clock over long distances.

Did You Know?



**OPTOCORE**

Signal distribution is all about being able to route multiple source inputs to multiple zone outputs and provide remote control, from the very simple to the very complex. There are a number of ways this can be done, with small non-programmable mixers, fixed signal chain programmable distribution such as dbx ZonePro or SC Series. Alternatively you can use an open architecture platform like BSS Soundweb (Green) or London (Blu), via the London Architect software you can create custom signal configurations using mixers, compressors, limiters, crossovers, EQ and even room combining thus providing a tailored solution to exacting requirements. It is all relative to your customers needs, but rest assured we have a solution for all occasions. To find out just what you need for your next distributed multizone installation contact our Technical Resource Group on 02 9582 0909.

## Networkable

### BSS BLU-800



- Up to 16 mic/line inputs or line level outputs, configurable in 4 banks of 4 input or output channels
- BluLink 256 channel redundant audio bus
- Room combining
- CobraNet™ CM-1 module offering up to 32 x 32 network channels
- 4 times DSP power of BLU 80
- Analogue and digital input cards
- Integral multi-voltage switched mode PSU for lightweight and universal AC mains operation
- 12 analogue control ports and 6 logic outputs for GPI hardware interfacing
- RS-232 port for third party serial control
- Ethernet port for control network

### BSS BLU-320



- No DSP
- Up to 16 mic/line inputs or line level outputs, configurable in 4 banks of 4 input or output channels
- BluLink 256 channel redundant audio bus
- Audio CobraNet™ CM-1 module offering up to 32 x 32 network channels
- Analogue and digital input cards
- Integral multi-voltage switched mode PSU for lightweight and universal AC mains operation
- 12 analogue control ports and 6 logic outputs for GPI hardware interfacing using faders, pots, switches etc
- RS-232 port for third party serial control
- Ethernet port for control network

### BSS BLU-160



- Up to 16 mic/line inputs or line level outputs, configurable in 4 banks of 4 input or output channels
- BluLink 256 channel redundant audio bus
- Room combining
- 4 times DSP power of BLU 80
- Analogue and digital input cards
- Integral multi-voltage switched mode PSU for lightweight and universal AC mains operation
- 12 analogue control ports and 6 logic outputs for GPI hardware interfacing using faders, pots, switches etc
- RS-232 port for third party serial control
- Ethernet port for control network

### BSS BLU-120



- No DSP
- Up to 16 mic/line inputs or line level outputs, configurable in 4 banks of 4 input or output channels
- BluLink 256 channel redundant audio bus
- Analogue and digital input cards
- Integral multi-voltage switched mode PSU for lightweight and universal AC mains operation
- 12 analogue control ports and 6 logic outputs for GPI hardware interfacing using faders, pots, switches etc
- RS-232 port for third party serial control
- Ethernet port for control network

### BSS BLU-80



- Up to 16 mic/line inputs or line level outputs in a single frame, configurable in 4 banks of 4 input or output channels
- Peak Audio CobraNet™ CM-1 module offering up to 32 x 32 network channels
- Massive DSP power in each frame
- Analogue and digital input cards
- Integral multi-voltage switched mode PSU for lightweight and universal AC mains operation
- 12 analogue control ports and 6 logic outputs for GPI hardware interfacing using faders, pots, switches etc
- Rear RS-232 port for third party serial control
- Ethernet port for control network

### BSS BLU-32



- No DSP
- Up to 16 mic/line inputs or line level outputs, configurable in 4 banks of 4 input or output channels
- Analogue and digital input cards
- CobraNet™ CM-1 module offering up to 32 x 32 network channels
- Integral multi-voltage switched mode PSU for lightweight and universal AC mains operation
- 12 analogue control ports and 6 logic outputs for GPI hardware interfacing using faders, pots, switches etc
- RS-232 port for third party serial control
- Ethernet port for control network

### BSS BLU-10

The original Soundweb 9010 programmable controller set new standards in control interfacing to DSP systems. The Soundweb London equivalent, the BLU-10, builds on that power and reputation by adding touch-screen control to make a more attractive and potentially cost-saving control solution. It is possible that a BLU-10 could replace a more expensive proprietary touch screen solution where simpler control interfacing is required. Available in black, white or blue.



### BSS BLU-8

The BLU-8 is a programmable zone controller capable of controlling a single zone, four zones or eight zones in different modes of operation. A simple control surface and informative visual feedback ensure that non-technical users can be confident in making changes to an integrated AV system. The BLU-8 is available in black or white.



### BSS BLU-6 wall-mount controller

BLU-6 wall panels are simple controllers which allow the designer to provide level control and source selection or preset recall in a simple wall-mounted panel. 8 source selections plus volume up and down buttons.





## Networkable

	Signal Processing	CobraNet	BLU-Link
<b>BLU-800</b>	4x	✓	✓
<b>BLU-80</b>	1x	✓	✗
<b>BLU-320</b>	✗	✓	✓
<b>BLU-32</b>	✗	✓	✗
<b>BLU-160</b>	4x	✗	✓
<b>BLU-16</b>	1x	✗	✗
<b>BLU-120</b>	✗	✗	✓



### BSS sw9088iis DSP Hardware

- 8 inputs & outputs
- Fully configurable software programmability
- Analogue and digital input cards
- Fully networkable audio
- Multiple remote control devices



### BSS sw9008iis Output Expander

- Same DSP engine as 9088iis
- 8 Analogue outputs only
- Cost effective system expansion

### BSS sw9010 'Jellyfish' Remote Controller

The 9010 remote control panel connects to the Soundweb network via category five cable using RJ-45 connectors. The unit provides a graphic LCD display, six programmable soft keys, a programmable parameter wheel, and two inputs (1 x internal mic & 1 x external mic) for paging.



### BSS sw9012 Wall Panel

Where installations require a simple hardware controller, the 9012 provides an instant solution for volume and source select functions (for example). 5 source selections plus rotary volume control.



### BSS sw9014 Fibre Interface

Extending the network distance by up to 2km (1.2miles), the 9014 fibre interface simply connects into the system using the cat 5 RJ-45 terminations.

### BSS sw9015 Wall Panel

The Soundweb 9015 wall panel is a simple hardware interface to the Soundweb programmable DSP system. 8 source selections plus volume up and down buttons.



**tips  
guide**

Where complex, networked signal routing and control is required the only choice is BSS SoundWeb or London. Comprehensive I/O facilities in analogue or digital and programmable remote control. BSS has provided solutions for many major projects such as the MCG, Darling Harbour and Sydney Olympic Park.

## Stand Alone



### dbx DriveRack 220i

- Mixing and routing solution
- 2 inputs, 2 outputs
- Advanced Feedback Suppression (AFS™)
- Auto gain control
- Compression
- Limiting
- Noise Gating
- Notch filtering
- Bandpass and crossover filters
- Parametric and graphic EQ
- Security lockout
- Remote wall panel control
- Software GUI
- RS-232 control
- dbx ZC and Remote wall panel control



### dbx DriveRack 260

- Mixing and routing solution
- 2 inputs, 6 outputs
- Advanced Feedback Suppression (AFS™)
- Auto gain control
- Compression
- Limiting
- Noise Gating
- Notch filtering
- Bandpass and crossover filters
- Parametric EQ
- Security lockout
- Remote wall panel control
- Software GUI
- RS-232 control
- dbx ZC and Remote wall panel control



### dbx ZonePRO 640/641

- Complete routing solution
- 6 inputs, 4 outputs
- Advanced Feedback Suppression (AFS™)
- Autowarmth®
- Auto gain control
- Compression
- Limiting
- Noise Gating
- Notch filtering
- Bandpass and crossover filters
- Parametric EQ
- Security lockout
- RS-232 control
- dbx ZC and Remote wall panel control

**STOP PRESS:**

New M Version available by time of print. Check CD for the new specs!



### dbx ZonePRO 1260/1261

- Complete mixing and routing solution
- 12 inputs, 6 outputs
- Advanced Feedback Suppression (AFS™)
- Autowarmth®
- Auto gain control
- Compression
- Limiting
- Noise Gating
- Notch filtering
- Bandpass and crossover filters
- Parametric EQ
- Security lockout
- RS-232 and Ethernet control
- dbx ZC and Remote wall panel control



### BSS sw3088iis DSP Hardware

- 8 inputs & outputs
- Fully configurable software programmability
- Analogue and digital input cards
- Multiple Remote control devices
- Standalone device no audio networking capability
- Cost-effective solution for smaller installs where a 8 i/o count is sufficient



### BSS BLU-16

- Up to 16 inputs or outputs in a single frame, configurable in 4 banks of 4 input or output channels
- Massive DSP power in each frame
- Integral multi-voltage switch mode PSU for lightweight and universal AC mains operation
- 12 analogue control ports and 6 logic outputs for GPI hardware interfacing using faders, pots, switches etc
- Rear RS-232 port for third party serial control
- Standalone device no audio networking capability
- Cost-effective solution for smaller installs where a 16 i/o count is sufficient



### dbx DriveRack 4800

- Mixing and routing solution
- 48 and 96 kHz operation with Wordclock input
- Full color QVGA display
- 4 analogue and AES/EBU inputs
- 8 analogue and AES/EBU outputs
- Optional Jensen® I/O transformers
- Bandpass filter, crossover and routing
- 31-band graphic and 9-band parametric EQ on every input
- 6-band parametric EQ on every output
- Alignment delays
- DSP inserts on all inputs and outputs
- Ethernet HiQnet networking and control
- dbx ZC wall panel control



### dbx SC32 & SC64

- 32 or 64 channels of analogue I/O in banks of 8
- Mic/Line and Phantom power per channel on analogue input cards
- Ethernet/Serial control
- Logic I/O
- Rich palette of processing tools
- Wizard configuration
- Selectable DSP inserts on all inputs and outputs including Advanced Feedback Suppression (AFS), Automatic Gain Compensation (AGC), Compression, De-Essing and Notch Parametric Equalization
- Complete routing flexibility
- Comprehensive configuration, control and monitoring from HiQnet System Architect
- Events scheduler
- Optional ZC wall panel control
- Optional 2GB, Optional Media Engine for media playback and delayed page



## Stand Alone

### dbx ZC-1

The ZC-1 provides programmable remote volume control for the DriveRack 260, 220i, 4800 and the ZonePRO products.

- 1 x rotary volume control

### dbx ZC-2

The ZC-2 offers programmable volume and mute control for the DriveRack 220i, 260, 4800 and the ZonePRO products.

- 1 x rotary volume control
- 1 x mute button (TBC)

### dbx ZC-3

The ZC-3 can function as a program selector for the DriveRack 260, 220i and 4800. In addition it can be used for as a source selector, page steering control, or a scene selector for the ZonePRO products.

- 1 x rotary volume control
- 4 x select buttons control

### dbx ZC-4

The ZC-4 provides program change capability from contact closures for the DriveRack 220i, 260 and 4800. It can also provide source selection, page steering, or scene selection for the ZonePRO products.

- External contact closure

### dbx ZC-6

The ZC-6 is a programmable volume control for the DriveRack 4800 and ZonePRO products.

- 1 pair volume up/down buttons

### dbx ZC-7

The ZC-7 is a programmable push-to-talk page assignment controller for the DriveRack 4800 and ZonePRO products.

- 4 x select buttons

### dbx ZC-8

The ZC-8 provides both programmable source selection and volume control to the DriveRack 4800 and ZonePRO products.

- 1 x rotary 4 way select
- 1 x pair up/down volume

### dbx ZC-9

The ZC-9 provides source selection for the DriveRack 4800, ZonePRO 1260 and 1261 only.

- 1 x rotary 8 way select

### dbx ZC-BOB

The ZC-BOB allows "home run" or parallel wiring to the DriveRack and ZonePRO products.

### dbx ZC-FIRE

The ZC-FIRE is a dedicated fire safety interface for the DriveRack 4800 and ZonePRO products which allows selection of either system mute or scene selection upon being triggered by either a relay or control voltage from the fire safety system.

- External NO/NC contact closure

**tips  
guide**

When you need more inputs than outputs and plenty of programmability you must consider the dbx ZonePro 640 and 1260. These units not only provide complete signal routing, they offer remote control capability via a single Cat5 cable.

## CROWN MULTI CHANNEL MAGIC

For multi zone applications using dbx ZonePro, consider the Crown 660A, 6 channel amplifier for your high or low impedance audio distribution.



**crown**

see page 25

These tools are the lifeblood of audio systems. From equalisation to compression, limiting and gating, from loudspeaker management to feedback suppression and crossovers; these tools allow the signal to be manipulated in many ways to achieve maximum system performance in the environment it is operating. Utilising combinations of these tools will provide the desired results relative to the application.

## Loudspeaker Management



### dbx DriveRack PA

- 2 input, 6 output
- Stereo Feedback elimination
- Dual 28-band graphic EQ
- Compressor
- 120A Sub-harmonic synthesizer
- Parametric EQ
- Output limiters
- Alignment delay
- Pink Noise generator
- Auto-EQ with RTA
- Front panel RTA-M XLR input with phantom power
- Full graphic LCD display

**STOP PRESS:**

New PA Plus available soon. Keep your eyes out for it from July 09.



### dbx DriveRack 260

- 2 Inputs, 6 outputs
- Advanced Feedback Suppression (AFS™)
- Auto gain control
- Compression
- Limiting
- Noise gates
- Notch filters
- Bandpass and crossover filters
- Parametric EQ
- Security Lockout
- Software GUI
- RS-232 control
- dbx ZC and Remote wall panel control



### BSS FDS-334T Minidrive

- 2-input/4-output
- Menu-driven user interface
- Each output assignable to any input or sum of inputs
- Assignable parametric EQ and delay on each input
- Crossover, assignable parametric Q, mid-filter limiters, polarity and delay on each output
- Bessel, Butterworth, Linkwitz-Riley or WHISEworks-NTM crossover filter types
- 6, 12, 18, 24, 36, 48 or 52 dB crossover slopes (filter type dependent)
- 60 user programs
- LED bargraph meters on every input & output
- MIDI control



### BSS FDS-336T Minidrive

- 2-input/6-output
- Menu-driven user interface
- Each output assignable to any input or sum of inputs
- Assignable parametric EQ and delay on each input
- Crossover, assignable parametric Q, mid-filter limiters, polarity and delay on each output
- Bessel, Butterworth, Linkwitz-Riley or WHISEworks-NTM crossover filter types
- 6, 12, 18, 24, 36, 48 or 52 dB crossover slopes (filter type dependent)
- 60 user programs
- LED bargraph meters on every input & output
- MIDI control



### BSS FDS-366T

- 3 inputs/6 outputs
- 6, 12, 18, 24, 36, 48 or 52 dB crossover slopes (filter type dependent)
- Bessel, Butterworth, Linkwitz-Riley or WHISEworks-NTM crossover filter types
- 24-bit i/o converters
- 96kHz sample rate
- New DSP algorithms for absolute phase matching
- Alignment assistant for delay settings
- Stereo digital Input (44.1/48/88.2/96kHz AES)
- Dynamic equalisation all i/o's
- Assignable EQ filters
- Contact closure program recall
- Output transformer options
- RS-232, RS-485 and MIDI control options



### dbx DriveRack 4800

- 48 and 96kHz operation with Wordclock input
- Full Colour QVGA Display
- 4 Analogue and AES/EBU inputs
- 8 analogue and AES/EBU outputs
- Optional Jensen® I/O Transformers
- Bandpass filter, crossover and routing
- 31-band graphic and 9-band parametric EQ on every input
- 6-band parametric EQ on every output
- Alignment delays
- DSP inserts on all inputs and outputs
- Ethernet HiQnet networking and control
- dbx ZC wall panel control

## Equalisation

### dbx iEQ15

- Advanced Feedback Suppression (AFS™)
- Type V™ noise reduction
- PeakStopPlus™ limiting
- 2/3-octave constant Q frequency bands
- Switchable  $\pm 6$  or  $\pm 15$  dB boost/cut
- 18 dB/octave 40Hz low-cut filter
- $\pm 12$  dB input gain range
- XLR, TRS and Euroblock inputs and outputs
- Internal toroidal transformer
- Frequency response of 10Hz to 22kHz
- Dynamic range of greater than 113 dB
- Relay bypass for power failure system protection

### dbx iEQ31

- Advanced Feedback Suppression (AFS™)
- Type V™ noise reduction
- PeakStopPlus™ limiting
- 1/3-octave constant Q frequency bands
- Switchable  $\pm 6$  or  $\pm 15$  dB boost/cut
- 18 dB/octave 40Hz low-cut filter
- $\pm 12$  dB input gain range
- XLR, TRS and Euroblock inputs and outputs
- Internal toroidal transformer
- Frequency response of 10Hz to 22kHz
- Dynamic range of greater than 113 dB
- Relay bypass for power failure system protection

## Equalisation



### dbx 1215

- Dual 15 band graphic EQ
- +/-12 dB gain range
- Selectable +/- 6 or 15 dB cut/boost
- 45mm faders
- 40Hz low cut filter
- Four segment LED metering
- XLR/Barrier Strip/1/4" TRS connections



### dbx 1231

- Dual 31 band graphic EQ
- +/-12 dB gain range
- Selectable +/- 6 or 15 dB cut/boost
- 45mm faders
- 40Hz low cut filter
- Four segment LED metering
- XLR/Barrier Strip/1/4" TRS connections



### dbx 2215

- Dual 15 band graphic EQ
- +/-12 dB gain range
- Selectable +/- 6 or 15 dB cut/boost
- 45mm faders
- Type III® noise reduction
- PeakPlus™ limiter
- 40Hz low cut filter
- Four segment LED metering
- Status LEDs offer visual feedback for all settings on the front panel
- XLR/Barrier Strip/1/4" TRS connections



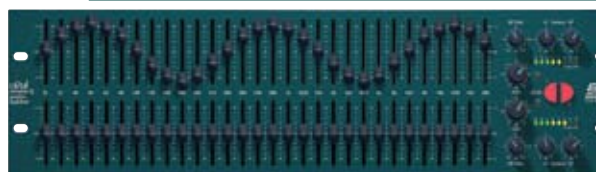
### dbx 2031

- 31 band graphic EQ
- +/-12 dB gain range
- Selectable +/- 6 or 15 dB cut/boost
- 45mm faders
- Type III® noise reduction
- PeakPlus™ limiter
- 40Hz low cut filter
- Four segment LED metering
- Status LEDs offer visual feedback for all settings on the front panel
- XLR/Barrier Strip/1/4" TRS connections



### dbx 2231

- Dual 31 band graphic EQ
- +/-12 dB gain range
- Selectable +/- 6 or 15 dB cut/boost
- 45mm faders
- Type III® noise reduction
- PeakPlus™ limiter
- 40Hz low cut filter
- Four segment LED metering
- Status LEDs offer visual feedback for all settings on the front panel
- XLR/Barrier Strip/1/4" TRS connections



### BSS FCS-966

- Dual 30-band graphic equaliser
- +/- 15 dB cut/boost
- Sweepable high pass filter
- High & low frequency contour
- 3RU
- Constant Q-filters
- 45mm faders
- Sweepable/switchable Hi-pass filter
- Gain control
- Electronic balanced inputs and outputs



### BSS FCS-960

- Dual 30-band graphic equaliser
- +/- 10 dB cut/boost
- Dual Mode switching between Normal and Fine filter width
- 3RU
- Constant Q-filters
- 45mm faders
- Sweepable/switchable Hi-pass filter
- Gain control
- Electronic balanced inputs and outputs

**tips  
guide**

The dbx DriveRack 260 is one of the most comprehensive, fully programmable speaker management processors available in its price range. Once you try it, you won't use anything else.



## Dynamics



### dbx 166XL Dual Channel Compressor/Limiter/Gate

- Goof proof operation
- Program-adaptive expander/gates
- Separate precision LED displays for gain reduction, compression threshold and gate threshold
- Stereo or dual-mode operation
- Balanced XLR and 1/4" TRS inputs/outputs
- Side chain insert
- Classic dbx® "Auto" mode



### dbx 1066 Dual Channel Compressor/Limiter/Expander Gate

- Selectable auto or manual compression
- Contour switch
- Selectable Hard Knee or Overeasy® compression
- PeakStopPlus™ limiting
- SC Ext and SC mon for monitoring external devices for gating function
- Balanced gold-plated XLR and 1/4" inputs and outputs
- True RMS level detection
- input, output, and gain reduction level metering
- True stereo or dual mono



### dbx 1074 Quad Gate

- Four independent channels of gating
- Independent key filtering
- Independent threshold and release controls
- Balanced gold-plated XLR and 1/4" inputs and outputs
- True RMS level detection
- Stereo coupling mode
- Switchable +4 dBu or -10 dBv operation per channel



### dbx 1046 Quad Compressor/Limiter

- Four independent channels or two stereo pairs
- PeakStopPlus™ limiting
- Independent threshold and release controls
- Switchable Hard Knee or OverEasy® compression
- Balanced gold-plated XLR and 1/4" inputs and outputs
- True RMS level detection
- Input, output, and gain reduction level metering
- Dual true stereo or quad mono operation
- Switchable +4 dBu or -10 dBV per channel

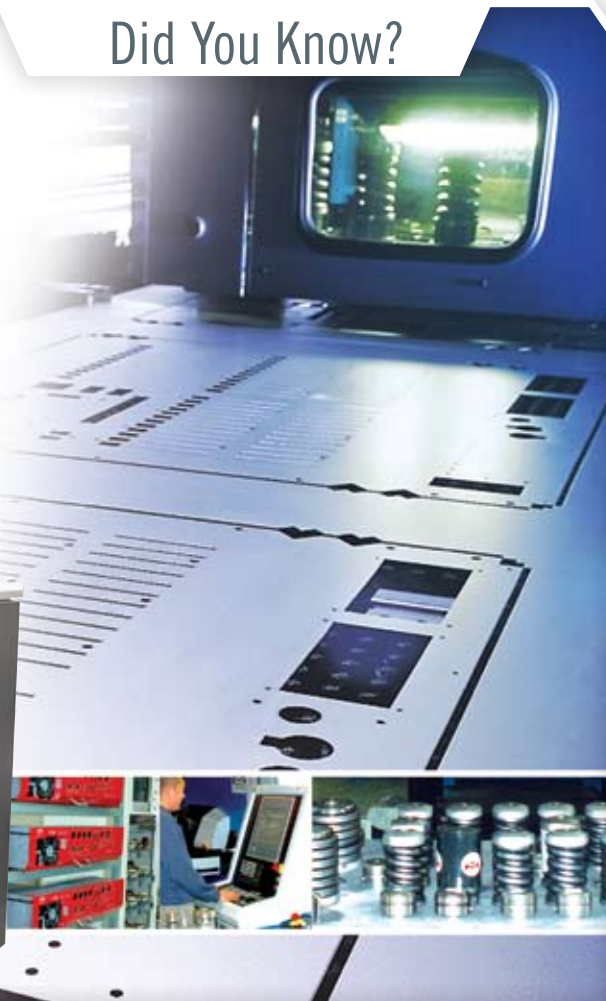
## Jands have a Custom Metalwork Department.

Jands can provide custom manufacturing for any project. With our inhouse design, metalshop and electronics manufacturing departments, we are well equipped to provide custom turn-key solutions or OEM products to your requirements.



**JANDS**

## Did You Know?



## Cross-Overs & Other



### dbx 223XL Stereo 2-way, Mono 3-way Crossover

- XLR balanced ins and outs
- Mode switch for stereo 2-way or mono 3-way
- Low frequency summed output
- x10 range switch on both channels
- 40Hz high pass filter
- Phase reverse switch on all outputs
- Individual level controls
- 24 dB per octave Linkwitz-Riley filters
- Stereo/mono status LEDs



### dbx 234XL Stereo 2 or 3-way, Mono 4-way Crossover

- XLR balanced ins and outs
- Mode switch for stereo 2-way, 3-way or mono 4-way
- Low frequency summed output
- x10 range switch on both channels
- 40Hz high pass filter
- Phase reverse switch on all outputs
- Individual level controls
- 24 dB per octave Linkwitz-Riley filters
- Stereo/mono status LEDs



### dbx AFS224 Advanced Feedback Suppressor

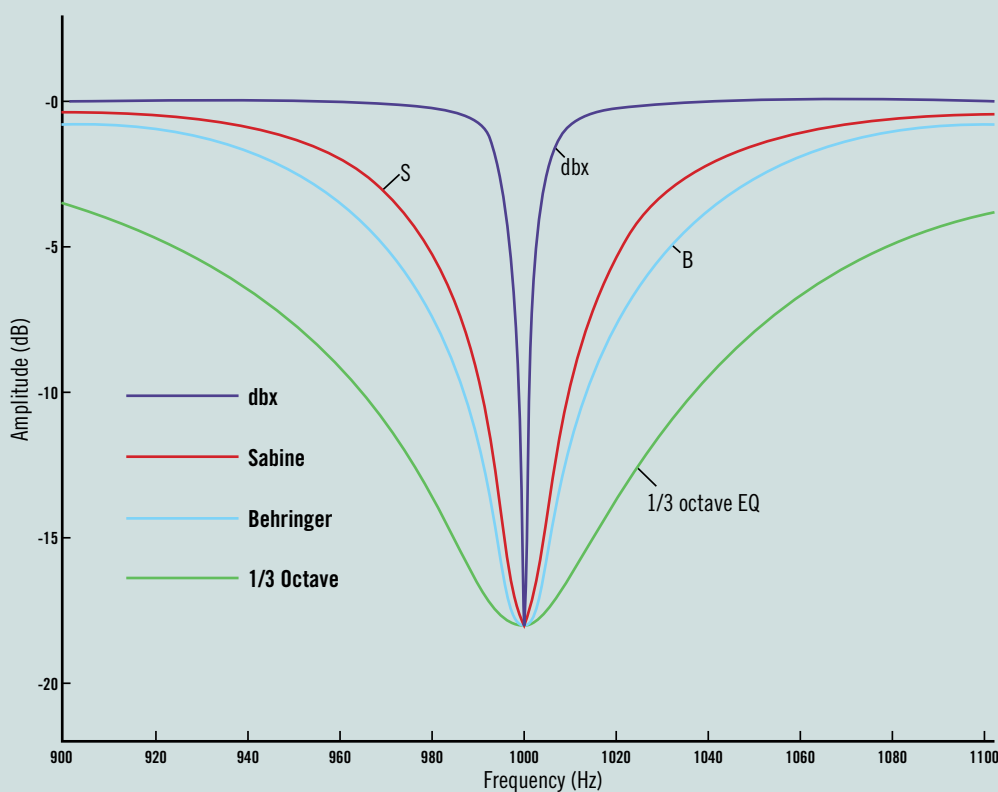
- dbx's patent-pending technology
- 24 programmable filters per channel
- Stereo or dual independent
- Live and fixed filter modes
- Selectable filter lift times
- Application-specific filter types include: Speech and Music Low, Med and High
- Input channel metering
- 24 LED metering
- XLR and TRS inputs and outputs

TECH-TIPS

### What is the difference between feedback suppressors?

All feedback suppressors are not the same. A feedback suppressor notches out the offending frequency by cutting the level of that frequency. But how many non offending frequencies around the offending frequency are affected by that filter?

This graph shows the difference in filter quality between **Behringer**, **Sabine** and the superior **dbx** filter. As you can see the **dbx** is much narrower. It removes far fewer of the surrounding frequencies than either of the competitors. This equates to a far smaller hole in the frequency response when feedback is being addressed by the processor.



Originally designed to reproduce the natural reverberant sound of live venues to enhance the recording process; today effects are used to also enhance and “fatten” the sound of live reproduction. In addition to creating some pretty radical sounds to individualise performers, effects are always a great add-on for any live sound system.

## Lexicon MX Series



### Lexicon MX200

- 16 reverbs
- Lexicon delays & modulation effects
- dbx® dynamics
- Dual-Processor design
- 4 Routing Configs: Dual Mono, Cascade, Dual Stereo (Parallel), Mono Split
- 99 Factory / 99 user programs
- S/PDIF digital I/O
- 24 bit, 48kHz sample rate



### Lexicon MX300

- 2-in / 2-out configuration
- 16 reverbs
- Lexicon delays & modulation effects
- dbx® compression and de-essing
- Dual Processor design
- 5 effect routing options
- 99 Factory / 99 user programs
- S/PDIF digital I/O
- 24 bit, 48kHz/44.1kHz sample rates
- Large front panel LCD display
- MIDI IN and THRU
- XLR and 1/4" TRS balanced I/O



### Lexicon MX400

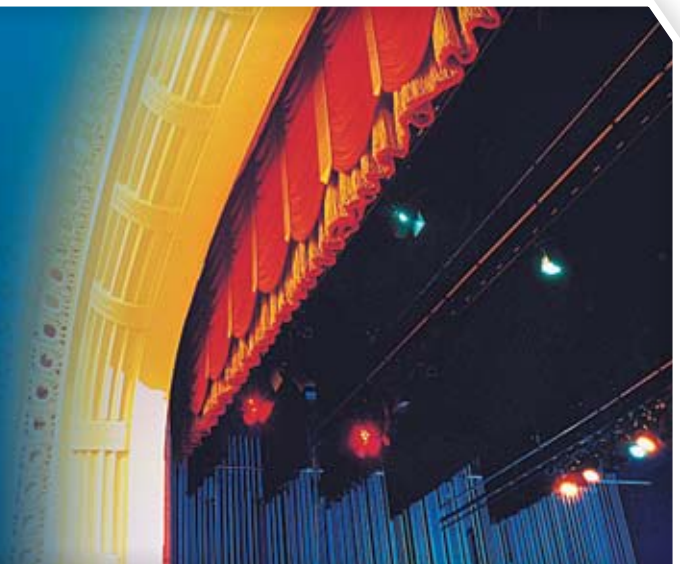
- 4 –in/4-out configuration
- 17 reverbs
- Lexicon delays & modulation effects
- dbx® compression and de-essing
- Quad-processor design
- 7 effect routing options
- 99 Factory/99 user programs for stereo mode
- Dual S/PDIF digital I/O
- 24 bit, 48kHz/44.1kHz sample rates
- Large front panel LCD display
- MIDI IN and THRU
- XLR or 1/4" TRS balanced I/O

**JANDS**  
*Staging*

**Complete Staging Solutions – Nationwide.**

Whether you want just a set of curtains for the school hall, or a completely automated stage for a world-class theatrical venue, *Jands can do it all.*

[www.jands.com.au/staging](http://www.jands.com.au/staging)





Crown's first amplifier was patented in 1949. In the 60's the DC300 lead the way, the 70's brought us the PSA Series followed by the Macro-Tech Series in the 80's. The 90's gave us IQ control and the turn of the century delivered the groundbreaking I-Tech Series. No other amplifier manufacturer can boast that their designs and developments have produced so many technological advances over such a significant span of time. Crown is the leader in amplifier technology.

## Selectable High/Low Impedance

### Crown's CTs Series amplifiers

- High power density
- 2 & 4 channel - 2RU
- 8 channel - 3RU
- Switching power supply
- High or low impedance
- 100V direct outputs on CTs 2000, 3000, 4200, and 8200
- Crown Class-I (BCA) and AB+B output topologies
- "FIT" (Fault Isolation Topology) circuitry on 4 and 8-channel models
- Comprehensive array of indicators provide accurate diagnostics
- 2 channel models PIP2-compatible.
- Multi-channel models accept MC accessory modules
- 3 Year, No Fault Warranty



### CTs 2 Channel Amplifiers

Minimum Guaranteed Power (20 Hz - 20 kHz)	CTs 600 Power at 0.1% THD	CTs 1200 Power at 0.1% THD	CTs 2000 Power at 0.35% THD	CTs 3000 Power at 0.35% THD
2-ohm Dual (per ch.)	150W	250W	1000W	1500W
4-ohm Dual (per ch.)	300W	600W	1000W	1500W
8-ohm Dual (per ch.)	300W	600W	1000W	1250W
16-ohm Dual (per ch.)	300W	300W	625W	625W
70V Dual (per ch.)	300W	600W	1000W	1500W
100V Dual (per ch.)	300W*	600W*	1000W	1500W

### CTs 4200

Dual Mode Channels Driven	4		2	1	
	1 kHz	20 Hz - 20 kHz	1 kHz	1 kHz	20 Hz - 20 kHz
4 Ohm	260	215	270	270	225
8 Ohm	180	190	210	220	210
70V (25 Ohm) at 0.1% THD	220	220*	240	250	245*

### CTs 8200

Dual Mode Channels Driven	8		4	2	1	
	1 kHz	20 Hz - 20 kHz	1 kHz	1 kHz	1 kHz	20 Hz - 20 kHz
4 Ohm	200	175	250	260	270	230
8 Ohm	160	155	190	200	220	220
70V (25 Ohm) at 0.1% THD	200	185*	220	240	250	230*

\* Constant Voltage full bandwidth power ratings support 100 Hz - 20 kHz due to automatic high-pass filters.

## Low Impedance Only

### Crown Macro-Tech i Series

The i series continues the Macro-Tech legacy of unparalleled sonic accuracy and detail, putting sound quality above all else.

- Patented, cutting-edge Class-I circuitry gets more power out of an amplifier with less waste
- Rugged construction ensures that all Macro-Techs are built to withstand years of abuse on the road
- Global power supply
- Studio-quality analogue signal processing with built-in load, line voltage, input and output monitoring

- Standard Ethernet networking via System Architect®
- Ultra light weight, just 12.7 Kg
- Balanced XLR analogue inputs
- Binding post & NL4 Speakon outputs
- Peak voltage and RMS power limiting
- Capable of 1 Ohm operation in stereo mode
- 3 Year, No Fault Warranty



### MA i Power Output

	Dual					Bridge	
	2 Ohm			4 Ohm	8 Ohm	4 Ohm	8 Ohm
	20 msec BURST	1kHz	20Hz - 20kHz	20Hz - 20kHz	20Hz - 20kHz	20Hz - 20kHz	20Hz - 20kHz
<b>MA 5000 i</b>	2,565	1,800	1,800	2,000	1,250	3,600	4,000
<b>MA 9000 i</b>	4,570	2,500	2,500	3,000	1,500	5,000	6,000
<b>MA 12000 i</b>	5,900	3,500	3,500	4,000	2,100	7,000	8,000

### Crown's I-Tech HD Series

- Ultra light weight, just 12.7 Kg
- Balance XLR analogue inputs
- Digital AES/EBU Inputs, 32-96kHz with onboard converter
- Binding post & NL4 Speakon outputs
- Global power supply
- Peak voltage and RMS power limiting
- Front panel LCD provides diagnostics and preset selection
- Front panel lockout

- Front panel USB connector transfers presets to/from a USB drive to the amp's DSP.
- Available with analogue, AES/EBU, CobraNet, HiQnet and Ethernet connectivity.
- User definable front panel security feature
- Ultra smooth processing by on-board high-definition BSS Omni-Drive HD DSP with 24-bit, 192 kHz Cirrus Logic SHARC A/D and D/A converters. World class FIR and IIR filters.
- 5th generation patented Class-I (BCA) circuitry.
- Remote monitoring and control via Ethernet

- Capable of 1 Ohm operation in stereo mode
- 3 Year, No Fault Warranty



### I-Tech HD Power Output

	Dual					Bridge	
	2 Ohm			4 Ohm	8 Ohm	4 Ohm	8 Ohm
	20 msec BURST	1kHz	20Hz - 20kHz	20Hz - 20kHz	20Hz - 20kHz	20Hz - 20kHz	20Hz - 20kHz
<b>I-T5000 HD</b>	3,000	2,000	2,000	2,500	1,250	4,000	5,000
<b>I-T9000 HD</b>	4,700	2,800	2,800	3,500	1,500	5,600	7,000
<b>I-T12000 HD</b>	5,900	3,750	3,750	4,500	2,100	7,500	9,000

## Selectable High/Low Impedance

### Crown's Commercial Audio Series amplifiers

- Cost effective
- High quality
- High or low impedance capability
- 180A, and 1160A are 1 channel
- 280A is 2 channel
- Balanced Phoenix-type inputs
- Tamperproof screw-terminal outputs
- Output current limiting
- DC & thermal protection
- Circuit breaker/fuse,
- 3 Year, No Fault Warranty



If performance for price is what you need, look to the Crown CDi range of amplifiers. Low or high impedance with on board processing and plenty of power, these amps are unbeatable.

**tips  
guide**

### Crown 660A amplifier

6 Channels for Multi Zone Distributed Audio.

- 6 x 60w @ 4Ω or 70/100v
- Balanced Phoenix type inputs
- Tamperproof screw terminal outputs
- Circuit breaker
- Limiting
- DC & thermal protection
- 3 Year, No Fault Warranty



### Crown's CDi Series amplifiers

- Extremely light weight, just 8.6 Kg
- Rated for 2, 4, 8 ohm loads and 70V/140V outputs.
- Balanced Phoenix connector inputs
- Barrier strip outputs
- Front-Panel LCD screen
- Onboard DSP includes crossovers, EQ filters, delay & output limiting.
- USB programmability
- Front panel lock out
- Switch-mode universal power supply.
- Up to 20 user defined DSP presets
- 3 Year, No Fault Warranty



### CDi Series Minimum Guaranteed Power

Per channel, both channels driven 1 kHz with 0.5% THD

	CDi 1000	CDi 2000	CDi 4000
2 ohm Dual (per channel)	700W*	1,000W*	1,600W*
4 ohm Dual (per channel)	500W	800W	1,200W
8 ohm Dual (per channel)	275W	475W	650W
4 ohm Bridge-Mono	1,400W*	2,000W*	3,200W*
70V Dual (per channel)	500W	800W	1000W
140V Bridge-Mono	1000W	1600W	2000W

\*With 1% THD (Total Harmonic Distortion)



## Low Impedance Only

### Crown's XLS Series power amplifiers

- Reliable design
- Rugged, all-steel 2U chassis (3U for XLS 5000)
- Efficient fans forced cooling
- Electronically balanced XLR inputs
- Touchproof binding post and Speakon® outputs
- Precision detented level controls
- Signal, clip and fault LEDs
- 3 Year, No Fault Warranty

XLS Series Minimum Guaranteed Power	XLS 202	XLS 402	XLS 602	XLS 802	XLS 5000
Per channel, both channels driven 1 kHz with 0.5% THD					
Stereo, 2 ohms (per ch.)	—	—	—	—	2,500W**
Stereo, 4 ohms (per ch.)	300W	450W	600W	800W	1,800W*
Stereo, 8 ohms (per ch.)	200W	300W	380W	500W	1,100W*
Bridge-Mono, 8 ohms	600W	900W	1,200W	1,600W	3,600W*
Bridge-Mono, 4 ohms	—	—	—	—	5,000W**
*With 0.1% THD (Total Harmonic Distortion)					
**With 1% THD (Total Harmonic Distortion)					



The Crown XLS202D and XLS402D are ideal for lower power, low impedance applications. Perfect for the entire JBL Control Contractor range.

Refer pages  
27 - 32

**tips  
guide**

### Crown's XTi Series amplifiers

- Integrated proprietary DSP with LCD front panel display
- Accurate, uncoloured sound with very low distortion
- Advanced protection circuitry
- Extremely versatile, handling a wide range of speaker impedances and outputs
- Switch-mode universal power supply
- Speaker presets for crossover frequencies, EQ, limiting, and delay
- All products fill 2U rack spaces and weigh under 8kgs
- Speakon® and binding post outputs, XLR inputs and loop-thrus

XTi Series Minimum Guaranteed Power, 1kHz	XTi 1000	XTi 2000	XTi 4000	XTi 6000
Per channel, both channels driven 1 kHz with 0.5% THD				
Stereo, 2 ohm Dual (per ch.)	700W*	1,000W*	1,600W*	3,000W*
Stereo, 4 ohm Dual (per ch.)	500W	800W	1,200W	2,100W
Stereo, 8 ohm Dual (per ch.)	275W	475W	650W	1,200W
Bridge-Mono, 4 ohm Bridge-Mono	1,400W*	2,000W*	3,200W*	6,000W*
Bridge-Mono, 8 ohm Bridge-Mono	1,000W	1,600W	2,000W	4,200W
*With 1% THD (Total Harmonic Distortion)				



- Comprehensive LED status per channel
- 3 Year, No Fault Warranty

### Can I connect a 70v rated loudspeaker to a 100v line system?

Yes. 70v and 100v systems are both constant voltage systems. The only difference being the maximum RMS voltage on the line (100v or 70v). 70v is 3dB down from 100v, which when converted to power, conveniently equals half power. So a 100v speaker connected to a 70v line system will draw HALF its rated power. Conversely a 70v speaker connected to a 100v line system will draw DOUBLE its power.

All you need to do is select the appropriate tap. For example:

1. You wish to connect 70v speaker to a 100v line system and set it to 10w. Select the 5w tap.
2. You wish to connect a 100v speaker to a 70v line and set it to 20w. Select the 40w tap

Please observe the maximum rated power of the loudspeaker and take care to avoid overloading the speaker. E.g. if you have a 70v speaker rated at 60w max and you wish to connect to a 100v line, do NOT select the 60w tap as this will draw 120W @ 100v. Select the 30w tap for maximum power.

James B. Lansing was the true pioneer of sound reinforcement, making his first loudspeaker in 1927. For 62 years JBL has been at the forefront of professional loudspeaker development and innovation. These innovations are still evident in products such as VerTec, VRX and the Control 40 Series ceiling products. Today, JBL is still the benchmark many others are measured by and rarely equalled on performance for price.

## Ceiling Mount

### JBL 8124

Cost effective, quality quick fit ceiling speaker including grille.



- 4 inch full range
- 60Hz-18kHz
- 93dB, 1W, 1m (1kHz-8kHz)
- 130° conical
- 6W, 3W, 1.5W, (.75W at 70V only)
- 206mm x 89mm (h x dia)

### JBL 8128

Cost effective, quality quick fit ceiling speaker including grille.



- 8 inch full range, dual cone
- 50Hz-16kHz
- 97dB, 1W, 1m (1kHz-8kHz)
- 90° conical
- 6W, 3W, 1.5W, (.75W at 70V only)
- 257mm x 105mm (h x dia)

### JBL Control 24C/CT Micro

Compact industry standard 4.5" for restricted ceiling cavity.



- 85Hz-25kHz
- 150° dispersion
- 30 watts program
- 86dB (1W/1m)
- Shallow steel back-can (only 4 in deep),
- Control 24CT 70V/100V taps: 8W, 4W, 2W, 1W, (and 0.5W for 70V only)
- 106 x 195mm (h x dia)

### JBL Control 24CT MicroPlus

High performance compact 4.5" for restricted ceiling cavity.



- As per Micro with high compliance transformer
- 70V/100V taps: 25W, 12W, (6W for 70V only)

### JBL Control 24C/CT

The contractors buddy. The industry standard 4" 2-way.



- 80Hz-20kHz
- 80 watts program
- 86dB (1W/1m)
- 16 ohms
- 130° conical coverage
- Control 24CT 70/100V taps: 30W, 15W, 7.5W, (3.7W 70V only)
- 200 x 195mm (h x dia)

### Control 26C/CT

When you need more. Affordable 6.5" performance.



- 75Hz-20kHz
- 150 watts program
- 89dB (1W/1m)
- 16 ohms
- 110° conical coverage
- 26CT 70/100V taps: 60W, 30W, 15W, (7.5W 70V only)
- 210 x 252mm (h x dia)

### JBL Control 26-DT

6.5" to fit 8" back cans. Retrofit special. When refurbishing an old 8" distributed system leave the back cans in place and refit using the 26-DT it slots straight in to most 8" back cans.



- 70Hz-20kHz
- 90° conical
- 60 watt transformer
- 89dB (1W/1m)
- 60W, 30W, 15W, (7.5W 70V only)
- 120 x 200mm (h x dia)

### JBL Control 19CS subwoofer

Complement your ceiling system with this 8" ceiling sub. More bass, more satisfaction.



- 42Hz-200Hz
- 200 watts program
- 95dB (1W/1m)
- 8 ohms
- 70/100V taps: 75W, 30W, 15W, (7.5W 70V only)
- 345 x 345mm (h x dia)

Today there is a speaker for every occasion. Which one do you use where? Check out the CD inside the front cover for JBL design guides for both Pro Sound and Ceiling applications. These are invaluable resources for any pro audio installer.

Refer to CD

tips  
guide

## Ceiling Mount

### JBL Control 42C

Ultra compact in ceiling satellite loudspeaker for use with the control 40C S/T subwoofer.



- 2.5 inch (60 mm) mid-high driver
- 140Hz-20kHz
- 30W program, 15W pink noise
- 82dB, 1W, 1m
- 160° conical
- 16Ω
- 127mm x 94mm depth

### JBL Control 47C/T

Consistent 120° coverage utilising Conical RBI® Technology (Radiation Boundary Integrator). Large backcan for extended bass response.



- 6.5 inch woofer, 1" tweeter
- 55Hz-20kHz
- 150W program, 75W pink noise
- 91dB, 1W, 1m
- 120° conical, consistent broadband
- 8Ω or 60W, 30W, 15W, (7.5W at 70V only)
- 305mm x 259mm

### JBL Control 47LP

Low profile for restricted cavity areas. Consistent 120° coverage utilising Conical RBI® Technology (Radiation Boundary Integrator).



- 6.5 inch woofer, 1" tweeter
- 68Hz-20kHz
- 150W program, 75W pink noise
- 91dB, 1W, 1m
- 120° conical, consistent broadband
- 8Ω or 60W, 30W, 15W, (7.5W at 70V only)
- 305mm x 142mm

### JBL Control 47HC

High ceiling applications. Defined 75° coverage utilising Conical RBI® Technology (Radiation Boundary Integrator).



- 6.5 inch woofer, 1" tweeter
- 55Hz-17kHz
- 150W program, 75W pink noise
- 93dB, 1W, 1m
- Defined 75° conical, consistent broadband
- 8Ω or 60W, 30W, 15W, (7.5W at 70V only)
- 332mm x 351mm

### JBL Control 40CST

Direct radiating subwoofer with built in passive crossover for sub/satellite applications.



- 8 inch long excursion woofer
- 32Hz-300Hz
- 200W program, 100W pink noise
- 95dB, 1W, 1m (near corner)
- 89dB 1W, 1m (ceiling centre)
- 8Ω or 80W, 40W, 20W, (10W at 70V only)
- 332mm x 338mm

**tips  
guide**

The JBL Control Contractor series is now perfectly complimented by the Crown CDI range of amplifiers for both high and low impedance installations.

refer page **26**

## Shure Microflex® Microphones



Low Profile Boundary



Multi Element Boundary



Wireless Boundary



Wired / Wireless Desktop Base



5" & 10" Gooseneck

Combining sleek, low profile aesthetics and a complete selection of microphones and mounting options, Microflex microphones include the highest standard of quality and efficiency for installed audio applications. All models offer Shure CommShield™ Technology, which guards against unwanted radio interference from consumer wireless devices such as mobile phones and PDA's.

refer page **5**

**SHURE®**  
LEGENDARY  
PERFORMANCE™



## Ceiling Mount



### JBL Control 226C/T

When only the best will do. The ultimate 6.5" 2-way with integrated back can & grille.

- 47Hz-19kHz
- 150 watts program
- 90dB (1W/1m)
- 8 ohms
- 120° conical
- 226CT 70/100V taps: 60W, 30W, 15W, (7.5W 70v only)
- 330 x 246mm (h x dia)



### JBL Control 227C/CT

When only the best will do. The ultimate 6.5" coaxial with independent back can & grille.

- 43Hz-19kHz
- 150 watts program
- 90dB (1W/1m)
- 8 ohms (227C)
- 120° conical
- 227CT 70/100V taps: 68W, 34W, 17W, (8.5W 70v only)
- 305 x 147mm (h x dia)



### JBL C300 12" Ceiling Speakers

Premium high-fidelity performance for no compromise systems.

#### 328C – 8" coax 2 way

- 45Hz-18kHz
- 250 watts
- 120° conical
- 93dB (1w/1m)
- 305 x 160mm (h x dia)

#### Optional

- MTC-300BB8 back box
- MTC-RG6/8 grille

#### 321C – 12" coax 2-way

- 34Hz-18kHz
- 250 watts
- 90° conical
- 94dB (1w/1m)
- 366 x 366mm square baffle
- 223mm depth

#### Optional

- MTC-300BB12 back box
- MTC-300SG12 grille

#### 328CT – As above with

- 60W transformer
- 60W, 30W, 15W, (7.5W 70v only)
- 305 x 218mm (h x dia)

#### 321CT – As per 321C with

- 60W transformer
- 68W, 34W, 17W, (8.5W 70v only)
- 366 x 366mm square baffle
- 240mm depth

#### 312CS – 12" in-ceiling subwoofer

- 30Hz-4.5kHz
- 400 watts
- 93dB (1w/1m)
- 8 ohms
- 366 x 366mm square baffle
- 160mm depth

## TECH-TIPS

### What is the difference between constant voltage system (70v/100v) and 'normal' system? And why should I choose one over the other?

Constant voltage systems step up the nominal voltage on the speaker line to a higher voltage, either 70v or 100v, to reduce the effects of cable losses. Constant voltage speakers present higher impedance to the line than 'normal' low impedance speakers. Higher impedance speakers draw less current from the amplifier, and since cable loss is proportional to current, cable losses are greatly reduced.

For example, let's consider two systems. System 1 is a traditional low impedance system. With 4 x 8 ohm loudspeakers connected to a 400w amplifier via 100m of 1mm<sup>2</sup> speaker cable.

**Total speaker load =  $8/4 = 2$  ohms**

**Loss on speaker cable = 9dB**

**Power delivered to the speakers = 49w**

**Speaker cable loss = 87%**

Wow, the majority of our amplifier power is being wasted heating up the speaker cable! Now let's change to a constant voltage system feeding 4 x 100v speakers tapped at 100w each.

**Total speaker load =  $100/4 = 25$  ohms**

**Loss on speaker cable = 1.2dB**

**Power delivered to speakers = 303w**

**Speaker cable loss = 24%**

You can see that the constant voltage system is far more efficient. In fact we would have to increase the speaker cable to 30mm<sup>2</sup> in the first example to even come close to the cable loss of the constant voltage system. That's a BIG cable, we're talking the stuff they use for welding cable!!!

## Surface Mount

### JBL Control 1 Pro

An industry legend - improved. Audio critical near field monitoring & A/V.



- 80Hz-20kHz
- 150 watts
- 87dB (1w/1m)
- Shielded
- 235 x 159 x 143mm (h x w x d)
- 1.8 kg
- Black or white
- Mounting bracket included

### JBL Control 5™

A larger legend. Audio critical monitoring & A/V.



- 75Hz-20kHz
- 175 watts
- 89dB (1w/1m)
- Shielded
- 387 x 251 x 229mm (h x w x d)
- 4.5 kg
- Black or white

### JBL Control 2PS

Powered Stereo pair of nearfield monitors for AV applications.



- 80Hz-20kHz
- 35 watts per channel
- 115dB peak per pair
- 4.2kHz X-over point
- 235 x 159 x 143 mm
- 4.8 kg



### JBL Control 2PM (Master Only)

Powered master nearfield monitor for AV applications.



- 80Hz-20kHz
- 35 watts
- 111dB peak
- 4.2kHz X-over point
- 235 x 159 x 143 mm
- 2.6 kg



### JBL MTC-2P

Wall Mount Kit for Control 2P Kit contains:



- 2 x wall mount brackets
- 1 x power supply cradle
- 2 x safety retaining cables
- 1 x wrench



The general industry standard is to quote the 1w/1m sensitivity of a passive loudspeaker. For powered speakers the Max SPL at full power is usually the specification quoted. To see all the Max SPL ratings

refer page **40**

### JBL Control 23/23T

3.5" 2-way ultra compact satellite speaker - general purpose.

- 85Hz-22kHz
- 50 watts program
- 86 dB (1W/1m)
- 8 ohms
- 90° x 90°
- 70v - 5w, 100v - 10w (23T)
- 193 x 140 x 111mm (H x W x D)
- 1.8 kg (23)
- 2.2 kg (23T)
- Black or white



### JBL Control 25/25T

5.25" 2-way compact satellite speaker - general purpose.

- 80Hz-16kHz
- 150 watts program
- 88 dB (1W/1m)
- 8 ohms
- 90° x 90°
- 70/100v - 30W, 15W, 7.5W (3.7W 70v only) (25T)
- 236 x 188 x 149mm (H x W x D)
- 2.3 kg (25)
- 3.6 kg (25T)
- Black or white



## Surface Mount



### JBL Control 25AV

5.25" 2-way, compact shielded - the best choice for indoor/outdoor applications.

- 70Hz-23kHz
- 200 watts program
- 87dB (1W/1m)
- Switchable 8 ohms or 70/100v 60W, 30W, 15W, (7.5W 70v only)
- Shielded
- 100° x 100°
- 236 x 186 x 159mm (H x W x D)
- 4.0 kg
- Black or white



### JBL Control 28

8" 2-way premium high performance - medium area, high SPL application.

- 60Hz-16kHz
- 175 watts program
- 92dB (1W/1m)
- 8 ohms
- 90° x 90°
- 380 x 280 x 220mm (H x W x D)
- 5.5 kg
- Black or white



### JBL Control 28T-60

8" 2-way premium high performance - medium area, high SPL application.

- 55Hz-15kHz
- 175 watts program
- 92dB (1W/1m)
- 70/100v 60W, 30W, 15W, (7.5W 70v only)
- 90° x 90°
- 380 x 280 x 220mm
- (H x W x D)
- 6.5 kg
- Black or white



### JBL Control 29AV-1

8", 2-way foreground music master - premium quality high fidelity, high output.

- 37Hz-18kHz
- 300 watts program
- 90dB (1W/1m)
- 8 ohms or 70/100v 110W, 55W, 28W, (14W 70v only)
- Shielded
- 110° x 85° (rotatable)
- 520 x 306 x 277mm (H x W x D)
- 12.2 kg
- Black or white



### JBL Control 30

10 inch, 3-way high fidelity, high output - large area, high SPL applications.

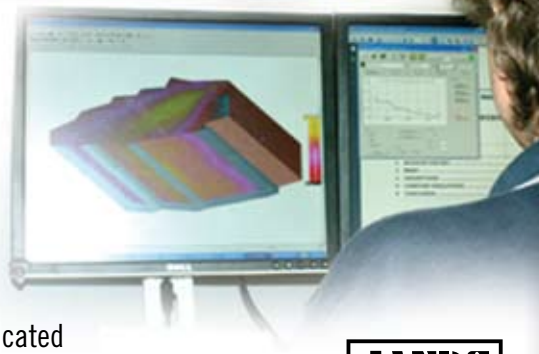
- 38Hz-17kHz frequency range
- 500 watts continuous program
- 120 x 110 degree coverage
- 150W, 75W, 38W at 70V/100V (plus 19W tap at 70V only)
- 8 Ohm bypass
- Outdoor-rated screw down input terminal strip
- Available in black or white (Control 30-WH)
- Dimensions 593 mm x 372 mm x 345mm
- Net Weight: 18.9 kg

## Technical Support Resources

Jands Technical Resource Group (TRG) provides technical and application support, project design and training for all audio and lighting products distributed and manufactured by Jands.

We have an extensive on-line Knowledge database as well as a dedicated support section on the Jands website [www.jands.com.au/support](http://www.jands.com.au/support)

## Did You Know?


**JANDS**



## In-Wall Mount



### JBL Control 126W/WT

6.5 inch, 2-way, in wall, premium quality, high performance.

#### Minimum 100mm cavity depth required

- 38Hz-20kHz
- 100 watts continuous program
- 88dB (1W/1m)
- 70V/100V transformer with taps at 30W, 15W and 7.5W (3.7W 70V only) (126WT)
- Aimable HF
- Optional MTC-126RIF rough-in-frame for new construction installation to wall studs.



### JBL Control 128W/WT

8 inch, 2-way, in wall, premium quality, high performance.

#### Minimum 105mm cavity depth required

- 30Hz-20kHz
- 120 watts continuous program
- 90dB (1W/1m)
- 70V/100V transformer with taps at 50W, 25W and 12W (6W 70V only) (128WT)
- Aimable HF
- Optional MTC-128RIF rough-in-frame for new construction installation to wall studs.

## Subwoofers



### JBL Control SB210

2 x 10" sub woofer, high performance low frequency reproduction.

- 42Hz-200Hz
- 400 watts continuous power
- 95dB (1W/1m)
- 8 ohms impedance
- IEC 529 IP-X5 rating. Exceeds MilSpec 810 for humidity, salt spray, temperature & UV
- AV shielded
- SonicGuard™ Overload Protection
- 355 x 590 x 570 mm (H x W x D)
- 17.1 kg



### JBL Control SB-2

10 inch, dual voice coil subwoofer, affordable distributed low frequency reproduction.

- 38Hz-160Hz
- 340 watts continuous power
- 100dB (1W/1m)
- 8 ohms per channel
- Dual-slope 80Hz and 160Hz low-pass crossover to woofer
- 160Hz high-pass crossover to satellite outputs
- Spring-loaded terminals
- 394 x 585 x 343mm
- 19.1 kg

**tips  
guide**

The JBL JRX112Mi and JRX115i perform admirably with the Crown XLS602D amplifier, which allows good headroom for optimum system performance.

refer page



### TECH-TIPS

#### Which power amplifier is best suited to my speakers?

Unfortunately this is not a simple question to answer. The amplifier should be 'sized' based on the maximum rated input power of the loudspeaker(s) and the duty cycle of the intended program material. For example, are the speakers to be used for touring? nightclub? small club/bar?

A good rule of thumb is as follows:

- If the program material contains short, controlled bursts of signal, eg. recording studio or cinema, an amplifier of up to 4 times the speaker's continuous power rating can safely be used.
- If the program material contains mildly compressed whilst still reasonably dynamic signals, eg. live bands or recorded music replay, an amplifier of up to 2 times the speaker's continuous power rating can safely be used.
- If the program source contains highly compressed signal or is to be played at continuously high output for long periods of time, eg. loud bar, mobile DJ or nightclub, an amplifier equal to the speaker's continuous power rating can safely be used.

It is not good practice to use an amplifier that has a lower power rating than the speaker's continuous power rating because amplifier clipping may result in damage to the speaker's voice coil and components.

Refer to tech notes: JBL – Danger Low Power on CD.

# Unpowered

## JBL JRX112Mi

- 60Hz-16kHz
- 99dB SPL (1W/1m)
- 8 ohms
- 250 watts continuous
- 90° x 50°
- 577mm x 399mm x 325mm
- 19.5 kg



## JBL JRX115i

- 38Hz-16kHz
- 98dB SPL (1W/1m)
- 8 ohms
- 250 watts continuous
- 90° x 50°
- 686mm x 470mm x 432mm
- 27.4 kg



## JBL AE Range - Compact Series AC15 - Ultra Compact 2-way Loudspeaker

Premium quality, timber background/foreground/speech application.

- 5.25" + 1" Dome Tweeter
- 80Hz-20kHz
- 86dB (1W/1m)
- 16Ω
- 225 watts continuous
- 90° x 90°
- Optional "U" Bracket or OmniMount
- 241 x 150 x 177mm
- 4.7 Kg



## JBL AE Range - Compact Series AC16 - Ultra Compact 2-way Loudspeaker

Premium quality, timber background/foreground/speech application.

- 6.5" + 1" Compression Driver
- 55Hz-20kHz
- 90dB (1W/1m)
- 16Ω
- 250 watts continuous
- 90° x 90°
- Optional "U" Bracket or OmniMount
- 381 x 199 x 226mm
- 7.2 Kg



## JBL AE Range - Compact Series AC18/95 & AC18/26 Compact 2-way Loudspeaker

Premium quality, timber background/foreground/speech/room fill application.

- 8" + 1" Dome Tweeter
- 52Hz-20kHz
- 92dB (1W/1m)
- 8Ω
- 375 watts continuous
- 90° x 50° (AC18/95)
- 120° x 60° (AC18/26)
- Optional "U" Bracket or OmniMount
- 470 x 237 x 254mm
- 12.8 Kg



## JBL AE Range - Compact Series AC25 Compact 2-way Loudspeaker

Premium quality, timber background/foreground/speech application.

- 2 x 5.25" + 1" Dome Tweeter
- 80Hz-20kHz
- 91dB (1W/1m)
- 16Ω
- 300W Continuous
- 90° x 90°
- Optional "U" Bracket or OmniMount
- 378 x 150 x 178mm
- 7.5 Kg



## JBL AE Range - Compact Series AC26 Compact 2-way Loudspeaker

Premium quality, timber background/foreground/speech/room fill/under balcony application.

- 2 x 6.5" + 1" Compression Driver
- 55Hz-20kHz
- 92dB (1W/1m)
- 8Ω
- 350 watts continuous
- 90° x 90°
- Optional "U" Bracket or OmniMount
- 540 x 199 x 226mm
- 11 Kg



## JBL AE Range - Compact Series AC28/95 & AC28/26 Compact 2-way Loudspeaker

Premium quality, timber background/foreground/speech/room fill/under balcony application.

- 2 x 8" + 1" Compression Driver
- 53Hz-20kHz
- 94dB (1W/1m)
- 8Ω
- 700 watts continuous
- 90° x 50° (AC18/95)
- 120° x 60° (AC18/26)
- Optional "U" Bracket or OmniMount
- 680 x 238 x 254mm
- 18.6 Kg



## Unpowered



### JBL AE Range - AC22 Series AC2212/XX

Premium quality general purpose 12" 2-way

- 12" + 1" HF
- 250 watts continuous
- 90° x 50°, 60° x 40° or 100° x 100° dispersion
- 50Hz-19kHz
- 95dB 1w/1m
- 15 x M10 hang points
- 548 x 355 x 352mm
- AC2212/64 – 18.1 kg
- AC2212/95 – 17.3 kg
- AC2212/00 – 19.1 kg



### JBL AE Range - AC22 Series AC2215/XX

Premium quality general purpose 15" 2-way

- 15" + 1" HF
- 250 watts continuous
- 90° x 50°, 60° x 40° or 100° x 100° dispersion
- 42Hz-19kHz
- 97dB 1w/1m
- 15 x M10 hang points
- 637 x 422 x 504mm
- AC2215/64 – 24 kg
- AC2215/95 – 23.6 kg
- AC2215/00 – 25 kg



### JBL AE Range - AM42 Full Range Series

Premium performance, easy installation and full range delivery. The AM42 full range series of installation speakers offers a variety of versatile cabinets to suit most applications. Available as a 12" or 15" 2-way, the AM42 series comes in dispersions of 60 x 40, 90 x 50 and 100 x 100 (12" only) degrees. Rated @ 300w (12") and 350w (15") continuous this series provides dynamic clarity and SPL. AM4212/64, AM4212/95, AM4212/00, AM4215/64, AM4215/95.

*See CD for model specifications*



### JBL AE Range - AM42 Mid/High Series

Premium performance, easy installation in a mid/high only cabinet. The AM42 mid/high series of installation speakers are dedicated mid/high units. Fitted with JBL's patented 6" CMCD™ horn loaded mid range and a 1.5" throat compression driver these cabinets are excellent for enhancing speech reproduction and are available in dispersions of 60 x 40 and 90 x 50 degrees. Rated @ 125w continuous The AM42 mid/high series delivers intelligibility. AM4200/64, AM4200/95.

*See CD for model specifications*

### JBL SRX700 Series Speakers

The advanced technology of SRX700 series speakers delivers the power and performance that you would expect from the highest quality, professional systems. At the same time, JBL innovation and design have reduced system weight and increased performance. All this value is housed in rugged birch enclosures for years of superb reliability.



**SRX712M** 12" 2-way utility speaker/stage monitor 800w, 90 x 50 degree dispersion, can be hung vertically with optional Yoke attachment.

**SRX715F** 15" 2-way high power speaker 800w, 75 x 50 degree dispersion, comes fitted with M10 hanging points and 3 point flytrack.

**SRX738F** 18" 3-way high power speaker 800w, 60 x 40 degree dispersion, 8" horn loaded midrange, comes fitted with M10 hanging points and 3 point flytrack.

**SRX725F** dual 15" 2-way high power speaker 1200w, 75 x 50 degree dispersion, comes fitted with M10 hanging points and 3 point flytrack.

Options SRX712M-YK Yoke attachment

**SRX-FF3:** 3x detachable flying fittings.

**229-00009-01:** 3 x 10 mm forged eyebolts.

*See CD for model specifications*

### How do I "bridge" the speaker outputs of my power amplifier?

All Crown amplifiers capable of bridge mode operation detail this in the user guide. In bridge mode both channels of the amplifier are run in 'push-pull' configuration and the load (loudspeakers) are wired between +ve of amplifier channel 1 and +ve of amplifier channel 2.

Bear in mind that a bridged load presents half the load impedance to each channel. That is, a 4 ohm bridged load presents a 2 ohm load to each channel. Normal minimum load impedance limits apply. In other words do not attempt to run a 2 ohm load in bridge as this will present a 1 ohm load potentially activating the amplifiers short circuit protection.

TECH-TIPS

**tips**  
guide

If you require top of the line, high performance, conventional point and shoot style loudspeakers JBL's SRX Series is king. Delivering extremely high power handling and SPL with crystal clear reproduction they come fully equipped with flying hardware. The JBL SRX Series are ideally matched to the Crown MAI Series amplifiers and represent sensational value for money as do the Crown amplifiers.



## Powered

**JBL VP7210/95DP**

**Powered 10" 2-way** full range, integrated amplifier, peak/continuous power output 1750w/875w, frequency range 50Hz-20kHz, Peak Output 132dB SPL @ 1m.

**JBL VP7212**

**Powered 12" 2-way** full range, integrated amplifier, peak/continuous power output 2200w/1100w, frequency range 47Hz-20kHz, Peak Output 136dB SPL @ 1m, available in either 60 x 40 or 90 x 50 degree dispersion.

**JBL VP7215**

**Powered 15" 2-way** full range, integrated amplifier, peak/continuous power output 2200w/1100w, frequency range 45Hz-20kHz, Peak Output 137dB SPL @ 1m, available in either 60 x 40 or 90 x 50 degree dispersion.

**JBL VP7315**

**Powered 15" 3-way** full range, integrated amplifier, peak/continuous power output 2200w/1100w, frequency range 34Hz-20kHz, Peak Output 138dB SPL @ 1m, available in 60 x 40 degree dispersion.

**VP Options**

- DPIP Input Module** - Fitted standard, no remote control.
- DPAN Input Module** - Analogue network input module, remote control, analogue audio.
- DPCN Input Module** - CobraNet input module, remote control with digital audio.

**JBL VP Flying Hardware & Accessories**

- PA7212-2 Planar Array Kit for 2 wide VP7212
- PA7215-2 Planar Array Kit for 2 wide VP7215
- PA7315-2 Planar Array Kit for 2 wide VP7315
- PA7212-18V Planar Array Kit for 2 each VP7212 and 1 each VPSB7118 vertical array
- PA7212-18H Planar Array Kit for 2 each VP7212 and 1 each VPSB7118 horizontal array
- MTU7212 "U" Bracket for VP7212
- MTU7215 "U" Bracket for VP7215
- YM7212-15 Yoke Bracket for VP7212 and VP7215
- SM7200 Stand Mount for VP7212 and VP7215
- PM42 42" pole for use with SM7200 when used with VPSB7118 3 pc. M10 x 35 mm
- Forged Shouldered Eye-Bolt Kit (JBL part #229-00009-01)
- 3 pc. Detachable flying fittings (JBL part #SRX-FF3)

## Line Arrays

### JBL VRX928LA

Ultra compact constant curvature line array. Good for small live venues, churches, schools & auditoriums.

- 8" + 2 x 1" Neodymium HF
- 400 watts continuous (passive)
- 100° x 15° dispersion per unit
- 70Hz-20kHz
- 90dB 1w/1m (passive)
- Flying hardware built in
- 230 x 419 x 267mm
- 12.7 kg



### JBL VRX932LA-1

Compact constant curvature line array. Good for medium sized live venues, churches, schools & auditoriums.

- 12" + 3 x 1.5" Neodymium HF
- 800 watts continuous (passive)
- 100° x 15° dispersion per unit
- 57Hz-20kHz
- 95dB 1w/1m (passive)
- Flying hardware built in
- 349 x 597 x 381mm
- 21 kg



### JBL VRX932LAP

Powered, compact constant curvature line array. Good for medium sized live venues, churches, schools & auditoriums.



- 12" + 3 x 1.5" Neodymium HF
- 875 watts continuous amplifier
- 100° x 15° dispersion per unit
- 57Hz-20kHz
- 136dB peak

- Flying hardware built in
- 349 x 597 x 444mm
- 24 kg



### JBL VerTec VT4887A

Compact true line array. Good for larger live venues, churches, schools & auditoriums.

- 2 x 8" LF, 4 x 4" MF & 2 x 1.5" HF
- Bi Amp operation
- 1000w LF, 225w M/HF
- 100° x 10° per unit
- 55Hz-22kHz
- 97dB LF, 103dB M/HF (1W/1m)
- Integral flying hardware
- 281 x 787 x 415mm
- 30.4 kg



## Line Array. There's one for everybody

Line arrays are nothing mystical. The theory and the math of aligning arrays of multiple drivers have been around for more than half a century. Back in the '70's JBL was already utilising line array technology in the 4682 loudspeaker enclosure. It was not until the '90's that line array technology as we know it today was seriously experimented with.

The basic theory of line array is the coupling of multiple drivers, albeit that they are in separate enclosures, to better control vertical dispersion patterns and to increase the SPL at greater distances.

JBL VerTec, (Vertical Technology), was one of the pioneers in vertical line array. Today VerTec is the number one choice of line array by more live production companies worldwide than any other line array. In addition, it is also the most permanently installed line array, offering more performance and accuracy for your money than any other line array available.

It is from the VerTec DNA that the VRX900 Series Constant Curvature Line Array was born. The VRX900 is a cost effective, compact, lightweight and highly efficient series of cabinets, providing line array solutions for smaller applications. Designed for situations where longer throw and high performance is required, and the aesthetics of small single, vertical drops as opposed to large multi-tier horizontal arrays, are desired.

On the enclosed catalogue CD you will find a number of white papers on line array theory to help you better understand why line arrays are the way of the future. Also you will find the VerTec and VRX line array calculators which are designed to assist in system design for almost any application. Please do not hesitate to contact our Technical Resource Group for any guidance or design assistance you may require.

Below is our "Meet the Family" comparison chart. This chart shows the entire JBL family of line array element specifications, allowing for easy comparison and a quick reference to each elements component compliment and performance.

## JBL Line Array Reference Chart

	Model	Driver Complement	Power Handling AES Standard 2Hrs (watts)	Impedance (Ohms) LF/HF or LF/MF/HF	Dispersion (degrees) H x V or H only	Frequency Range (Hz-kHz)	Sensitivity (dB 1w/1m)	Max. SPL (dB) LF/HF Active	Dimensions - mm (h x w x d)	Weight (Kg)
Compact	VRX928LA	1 x 8" 2 x 1"	400 Passive 400/30 Active	8 Passive 8/16 Active	100 x 15	70-20	90 Passive 90/108 Active	122 Passive 122/128 Active	230 x 419 x 267	12.7
	VRX932LA-1	1 x 12" 3 x 1.5"	800 Passive 800/75 Active	8 Passive 8/8 Active	100 x 15	57-20	95 Passive 95/114 Active	130 Passive 130/139 Active	349 x 597 x 381	21
Mid Size	VRX932LAP Powered	1 x 12" 3 x 1.5"	875*	On Board Amplification	100 x 15	57-20	NA	136	349 x 597 x 444	24
	VT4887A Active 2-way	2 x 8" 4 x 4" 2 x 1.5"	LF - 1000 MF/HF - 225	8/8 Active	100 Nominal	55-22	LF - 97 MF/HF - 103	131-141 Freq/Bandpass Dependant	281 x 787 x 415	30.4
	VT4887ADP Powered	2 x 8" 4 x 4" 2 x 1.5"	1100*	On Board Amplification	100 Nominal	55-22	NA	136 Peak	279 x 787 x 563	39.7
	VT4888 Active 3-way	2 x 12" 4 x 5.5" 2 x 3"	LF - 2000 MF - 600 HF - 150	2 x 8/8/16 Active	90 Nominal	48-18	LF - 98 MF - 102 HF - 114	136-146 Freq/Bandpass Dependant	356 x 991 x 508	51
Large Format	VT4888DP Powered	2 x 12" 4 x 5.5" 2 x 3"	3000*	On Board Amplification	90 Nominal	48-18	NA	140 Peak	378 x 1000 x 673	68
	VT4889-1 Active 3-way	2 x 15" 4 x 8" 3 x 3"	LF - 2 x 1000 MF - 1400 HF - 225	2 x 8/8/16 Active	90 Nominal	40-18	LF - 99 MF - 102 HF - 116	138-146 Freq/Bandpass Dependant	489 x 1213 x 546	79.8
	VT4889ADP Powered	2 x 15" 4 x 8" 3 x 3"	3000*	On Board Amplification	90 Nominal	40-18	NA	143 Peak	494 x 1215 x 692	93.1

\* Self Powered - Amplifier Continuous Output



## Subwoofers

### JBL JRX118S

Works well with JRX112Mi/115i or as a supplement to larger control series installations.

- 18" compact subwoofer
- 350 watts continuous
- 96dB (1W/1m)
- 38Hz-300Hz
- 4Ω impedance
- 605 x 508 x 551mm
- 32.2 kg



### JBL MRX518S

Works well with AC2212/2215.

- 18" bass reflex subwoofer
- 500 watts continuous
- 94dB (1W/1m)
- 40Hz-200Hz
- 4Ω impedance
- 560 x 535 x 700mm
- 32.5 kg



### JBL MRX528S

Works well with AC2212/2215 where extended LF is required.

- 2 x 18" bass reflex subwoofer
- 1000 watts continuous
- 97dB (1W/1m)
- 35Hz-250Hz
- 4Ω impedance
- 1095 x 535 x 700mm
- 55 kg



### JBL SRX718S

Ideal for use with VRX932LA when flying is not required or for general high SPL sub bass reproduction.

- 18" bass reflex subwoofer
- 800 watts continuous
- 95dB (1W/1m)
- 31Hz-220Hz
- 8Ω impedance
- 508 x 597 x 749mm
- 36 kg

### JBL SRX728S

For when serious sub bass is required in larger rooms.

- 2 x 18" bass reflex subwoofer
- 1600 watts continuous
- 98dB (1W/1m)
- 27Hz-220Hz
- 4Ω impedance
- 602 x 1067 x 838mm
- 76 kg



### JBL VRX915S

Matching sub for the VRX928LA line array.

- 15" bass reflex subwoofer
- 800 watts continuous
- 91dB (1W/1m)
- 35Hz-250Hz
- 4Ω impedance
- Integrated VRX flying hardware
- 496 x 420 x 597mm
- 26 kg



### JBL VRX918S

Matching sub for the VRX932LA line array.

- 18" bass reflex subwoofer
- 800 watts continuous
- 95dB (1W/1m)
- 31Hz-220Hz
- 8Ω impedance
- Integrated VRX flying hardware
- 508 x 597 x 749mm
- 37 kg



### JBL VRX918SP

Matching sub for the VRX932LAP powered line array.

- 18" powered subwoofer
- 750 watts continuous amplifier
- 126dB peak
- 31Hz-220Hz
- Integrated VRX flying hardware
- 508 x 597 x 749mm
- 38.5 kg



## Subwoofers

**JBL PD5122**

High output, low profile for extended LF application where frontal area is an issue.

**NB:** cabinet is quite deep.

- 2 x 12" slot loaded cabinet
- 1200 watts continuous
- 96dB (1W/1m)
- 31Hz-1000Hz
- 4Ω/2 x 8Ω impedance
- 20 x M10 fittings
- 375 x 673 x 706mm
- 36.4 kg

**JBL VT4881A**

Matching sub for the VerTec VT4887A line array.

- 18" arrayable subwoofer
- 2000 watts continuous
- 91dB (1W/1m)
- 25Hz-160Hz
- 8 Ω impedance
- Integral flying hardware
- 787 x 569 x 654mm
- 50.4 kg

**JBL VPSB7118DP**

Matching sub for VP series or where premium quality sub bass is required.

- 18" powered subwoofer
- 1800 watts continuous amplifier
- 129dB peak
- 29Hz-165Hz
- Fly track & 24 x M10 fittings
- 515 x 702 x 813mm
- 54 kg

**JBL ASB6128V**

Premium performance sub woofer for large, high SPL systems where extreme sub bass extension is required.

- 2 x 18" "V" loaded subwoofer
- 1600 watts continuous
- 102dB (1W/1m)
- 22Hz-300Hz
- 4Ω or 2 x 8Ω impedance
- 13 x M10 fittings
- 967 x 561 x 1215mm
- 89.8 kg



## TECH-TIPS

**What is the best placement for subs?**

In many small to medium sized applications it becomes more cost effective to run sub woofers from a Mono feed. In most applications audio below 200Hz is omnidirectional which defeats the purpose of Stereo imaging. This also facilitates the ability to place the subs together, creating a coupling effect, this coupling increases sub output 3dB for every sub coupled. Eg one dual 18" sub delivers 98dB 1w/1m, place a second dual 18" sub on top and the output steps up 3dB to 101 db 1w/1m.

A 3dB output increase is also attainable by placing individual subs in corners or against solid walls. For each surface you increase output by 3db, eg: On the floor (1 surface) +3dB, against a wall (2 surfaces) +6dB and in a corner (3 surfaces) +9dB. This works well in bars, clubs and restaurants where space is limited; a smaller sub can still provide more than adequate output.



# JBL Sound Reinforcement Reference Chart

These are point and shoot type speaker systems only. This chart does not include Line Array product (refer page 37).

	Model	Driver Complement	Power Handling AES Standard 2Hrs (watts)	Dispersion (degrees)	Frequency Range (Hz-kHz)	Sensitivity Passive Mode (dB 1w/1m)	Max. SPL (dB)	Dimensions - mm (h x w x d)	Weight (Kg)
Compact	JRX112Mi	12" 2-way	300 (100hrs)	90 x 50	60-16	99	129	577 x 399 x 325	19.5
	JRX115i	15" 2-way	300 (100hrs)	90 x 50	38-16	98	128	699 x 460 x 432	27.4
	AC15	5.25" 2-way	225	90 x 90	80-20	86	108	241 x 150 x 177	4.7
	AC16	6.5" 2-way	250	90 x 90	55-20	90	110	381 x 199 x 226	7.2
	AC18	8" 2-way	375	90 x 50 120 x 60	52-20	92	116	470 x 237 x 254	12.8
	AC25	2 x 5.25" 2-way	300	90 x 90	80-20	91	115	378 x 150 x 178	7.5
Mid Size	AC26	2 x 6.5" 2-way	350	90 x 90	55-20	92	117	540 x 200 x 226	11
	AC28	2 x 8" 2-way	700	90 x 50 120 x 60	53-20	94	120	680 x 238 x 254	18.6
	AC2212/XX	12" 2-way	300	60 x 40 90 x 50 100 x 100	50-19	95	126	548 x 355 x 352	18.1 17.3 19.1
	AC2215/XX	15" 2-way	300	60 x 40 90 x 50 100 x 100	42-19	97	127	637 x 422 x 504	24 23.6 25
	AM4212/XX	12" 2-way	400	60 x 40 90 x 50 100 x 100	55-20	95	126	713 x 371 x 460	25.9 25.4 25.4
	AM4215/XX	15" 2-way	500	60 x 40 90 x 50	40-20	97	130	783 x 422 x 504	29
	AM4200/XX	Mid/High Only 6" + CD Horn Loaded	125	60 x 40 90 x 50	350-23	106	133	548 x 561 x 657	28.1 27.7
Large Format	SRX712M	12" 2-way	800	90 x 50	70-20	96	131	349 x 546 x 260	15
	SRX715F	15" 2-way	800	75 x 50	43-20	96	131	711 x 439 x 406	22
	SRX738F	18" 3-Way	800	60 x 40	35-20	95	130	1092 x 541 x 648	43
	SRX725F	2 x 15" 2-way	1200	75 x 50	37-20	99	136	1219 x 541 x 508	45
	VP7210DP	10" 2-way	875*	90 x 50	50-20	NA	132	521 x 293 x 303	18.4
	VP7212DP	12" 2-way	1100*	60 x 40 90 x 50	47-20	NA	136	702 x 384 x 524	35.4
	VP7215DP	15" 2-way	1100*	60 x 40 90 x 50	45-20	NA	137	766 x 448 x 524	38.6
	VP7315DP	15" 3-way	1100*	60 x 40	34-20	NA	138	915 x 529 x 625	44

\* Self Powered - Amplifier Continuous Output

# JBL Subwoofer Reference Chart

	Model	Driver Complement	Power Handling AES Standard 2Hrs (watts)	Frequency Range (Hz)	Sensitivity (dB 1w/1m)	Max. SPL (dB)	Dimensions - mm (h x w x d)	Weight (Kg)
Compact	JRX118S	1 x 18"	350 (100hrs)	38-300	96	133	605 x 508 x 551	32.2
	MRX518S	1 x 18"	500	40-200	94	127	560 x 535 x 700	32.5
	MRX528S	2 x 18"	1000	35-250	97	133	1095 x 535 x 700	55
Mid Size	SRX718S	1 x 18"	800	31-220	95	130	508 x 597 x 749	36
	SRX728S	2 x 18"	1600	27-220	98	136	602 x 1067 x 838	76
	VRX915S	1 x 15"	800	35-250	91	126	496 x 420 x 597	26
	VRX918S	1 x 18"	800	31-220	95	130	508 x 597 x 749	37
	PD5122	2 x 12"	1600	41-1000	96	134	357 x 673 x 706	36.4
Large Format	VPSB7118DP	1 x 18"	1800*	29-165	NA	129	515 x 702 x 813	54
	VT4881A	1 x 18"	2000	25-160	91	136	787 x 569 x 654	50.4
	ASB6128V	2 x 18"	2400	22-300	25-80Hz = 98 80-200Hz = 102	138	967 x 561 x 1215	89.8

\* Self Powered - Amplifier Continuous Output



# Floor Monitors

**JBL JRX112M**

Entry level general purpose floor monitor.

- 12" + 1" HF
- 250 watts continuous
- 50° x 90° dispersion
- 99dB (1W/1m)
- 60Hz-16kHz
- 584 x 399 x 325mm
- 19.5 kg


**JBL MRX512M**

Mid performance floor monitor.

- 12" + 1.5" HF
- 400 watts continuous
- 70° x 70° dispersion
- 97dB (1W/1m)
- 60Hz-20kHz
- 645 x 380 x 345mm
- 14.9 kg


**JBL PRX512M**

Mid performance, powered floor monitor.

- 12" + 1.5" HF
- Self powered
- 500 watts continuous amplifier
- 70° x 70° dispersion
- 133dB peak
- 46Hz-20kHz
- 650 x 380 x 350mm
- 18 kg


**JBL SRX712M**

High performance floor monitor.

- 12" + 3" HF
- 800 watts continuous
- 50° x 90° dispersion
- 96dB (1W/1m) (passive)
- 70Hz-20kHz
- 349 x 546 x 260mm
- 15 kg


**JBL VP7212MDP**

Premium performance, powered floor monitor.

- 12" + 4" diaphragm, 1.5" throat HF
- Self powered
- 875 watts continuous amplifier
- 50° x 90° dispersion
- 134dB peak
- 55Hz-20kHz
- 346 x 565 x 413mm
- 20.7 kg


**JBL VRX915M Pro Floor Monitor**

Premium performance floor monitor.

- 15" + 4" diaphragm, 1.5" throat HF
- 800 watts continuous
- 50° x 90° dispersion
- 98dB (1W/1m) (passive)
- 60Hz-20kHz
- 629 x 432 x 324mm
- 21 kg



At Jands, all our drapes are manufactured with fire safety as a first priority. We only build safe drapes, and what other kind would you want?

The things that make Jands drapes stand out from the rest can be summarised in four words:

*elegance, reliability, longevity, safety.*

**JANDS**
**Theatrical Drapes**

## JBL Speaker –

	Control 24CM	Control 24CTM	Control 24CT MP	Control 24C	Control 24CT	Control 26C	Control 26CT	Control 26-DT	Control 19CS	Control 226C	Control 226CT	Control 227C	Control 227CT	Control 328C	Control 328CT	Control 321C	Control 321CT	Control 322C	Control 322CT	Control 312CS	Control 23	Control 23T	Control 25AV	Control 25	Control 25T	Control 28	Control 28T-60	Control 29AV-1	Control 30	Control 126W
180A	✓	✓		✓		✓	✓														✓			✓		✓				
280A	✓	✓		✓		✓	✓			✓		✓									✓	✓			✓		✓			✓
1160A	✓	✓		✓		✓	✓			✓		✓										✓			✓		✓			
660A	✓	✓	✓	✓	✓	✓	✓			✓		✓									✓	✓	✓	✓	✓	✓	✓			✓
XLS202D	✓			✓	✓				✓		✓										✓									✓
XLS402D								✓															✓	✓		✓		✓	✓	
XLS602D																														
XLS802D																														
CDi1000	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓		✓		✓		✓												
CDi2000		✓	✓		✓	✓				✓		✓	✓	✓	✓				✓											
CDi4000		✓	✓		✓	✓		✓		✓		✓				✓	✓	✓												
CTs600	✓	✓		✓		✓	✓		✓	✓	✓	✓	✓	✓	✓	✓			✓											
CTs1200	✓	✓		✓		✓	✓			✓		✓		✓			✓	✓	✓											
CTs2000		✓	✓		✓	✓				✓		✓		✓					✓											
CTs3000		✓	✓		✓	✓				✓		✓		✓					✓											
CTs4200		✓	✓		✓	✓				✓		✓		✓					✓		✓		✓	✓		✓		✓		
CTs8200		✓	✓		✓	✓				✓		✓		✓					✓		✓		✓	✓		✓		✓		
IT-4000																														
IT-6000																														
IT-8000																														
✓ ●	Indicates amplifier used in Bridge-Mono Mode.																													
✓ *	Indicates SB210 should be used with optional SB210T 70/100v Input Module.																													



# Crown Amplifier Matrix

[illegible]



# Harman HiQnet

## What is HiQnet?

HiQnet is a communications protocol or language with which all device-types within the full audio signal path can communicate.

Co-developed and shared by elite engineers from all the brands within the Harman Pro Group, HiQnet merges the best features of all previous brand-independent communications protocols and thereby benefits from years of combined experience and is simultaneously optimised for all components of the full professional audio system.

## How Does It Work?

The full HiQnet system is configured and controlled with a single software application - Harman Pro System Architect. A comprehensive core PC application into which device-specific plugins developed by each Harman Pro brand can be loaded, System Architect has been written entirely from the ground up to achieve the goal of accommodating all requirements from all the links in a signal chain. System Architect has been optimised for use in both tour sound and installation environments and includes features enabling quick and easy system configuration for both disciplines.

Today's HiQnet system is built from flagship products from Harman Pro brands - BSS Audio, Crown International, dbx Professional, JBL Professional, Lexicon Pro, and Soundcraft

## Where Do I Use It?

The HiQnet system is a flexible and intelligent system. The protocol is versatile enough to traverse any transport methodology - current HiQnet compatible devices employ serial, USB and Ethernet connectivity. In addition, HiQnet's compliance with the Universal Plug and Play (UPnP™) standard enables HiQnet devices automatically to negotiate HiQnet network addresses between themselves and device IP address assignment when on an Ethernet network.

HiQnet control software not only includes the all the necessary editing of device and system parameters but also offer the most simple user interface available today for routing of networked audio - however complex the requirements. To assist with this, the HiQnet protocol itself is capable of wrapping around the transport medium employed by third-party networked audio protocols such as CobraNet.

Whether in real-time from a device's default software editor, from an advanced custom-designed control panel running on a touchscreen PC, with System Architect's optimised mode of operation for control from a wireless tablet PC or from a dedicated hardware touchscreen wall-controller, all parameters from across an entire HiQnet system are instantly accessible. Never before has such full control been at the operator's fingertips.

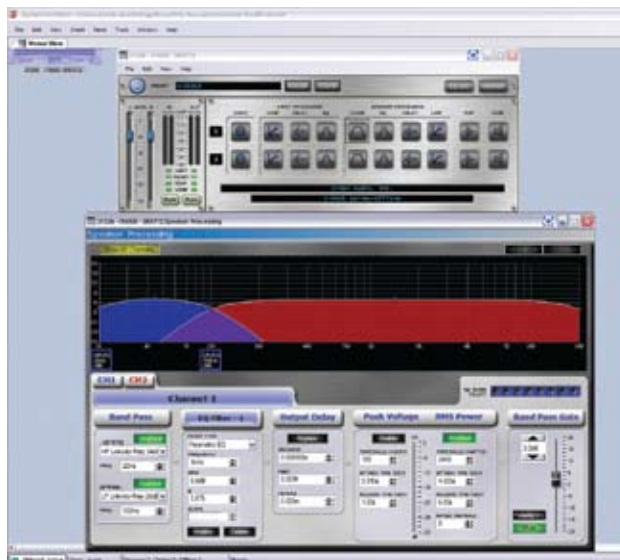
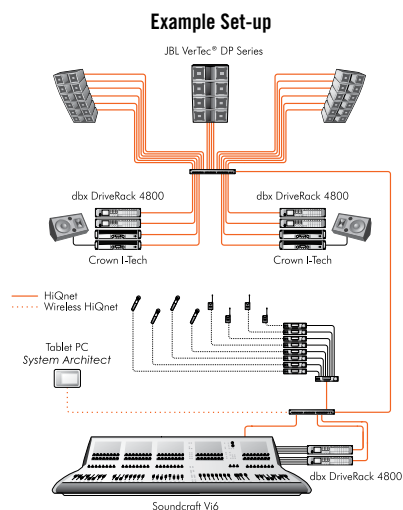
## Specifications

Supports Ethernet control, supports USB control, supports serial control, supports CobraNet audio, supports up to 64 channels of streaming audio, supports sample rates up to 96kHz, supports in excess of 65,000 HiQnet nodes in a single system, wireless 802.11b and 802.11g compatible, optimised for tablet PC use, optimised for remote access, universal plug and play (UPnP™) compliant, multiple computer support.

## HiQnet System Architect™

The core of HiQnet System Architect is engineered by a central Harman Pro R&D team. The software architecture enables Harman Pro brands to develop plugins for their products which integrate seamlessly with the core application. System Architect is currently at version 1.4 and uses the Harman HiQnet protocol to configure and control the following products:

Crown CDi series, Crown 2-channel CTs and MA series amplifiers with PIP LITE, USP3 or USP3/CN installed, Crown CTs 4200 USP/CN and 8200 USP/CN, Crown DSi series, Crown I-Tech series, Crown XTi series, Crown MAi Series, dbx DriveRack® 4800 and DriveRack® 4820, JBL VerTec® DP Series, JBL VP Series.



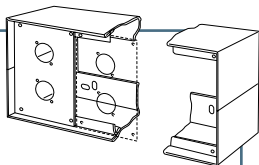
Jands are more than just a distributor; we have a fully equipped sheet metal shop that produces a large range of metal products. Racks, wall boxes, wall plates and stage boxes are all part of our standard range. Jands metal work can also manufacture custom metal products to suit a variety of applications. So, if you need custom work done give Jands a call to discuss your requirements.

## Jands Hardware

### Jands Wall Boxes

#### SB Series Termination System

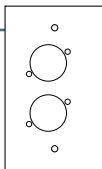
SB Series Termination System - Field Plates and Wall Boxes for Permanent Installation Designed for applications requiring a high quality, durable cable termination system. Both surface and flush style boxes are available in five sizes to accommodate from one to five standard size SB field plates. Plates are available to suit BNC, Neutrik D and other styles of connectors.



### Jands Plates

#### GPO Series Field Plates

GPO Size Field Plates for Permanent Installation Designed for applications requiring a high quality, durable termination system which matches the size and mounting centres of a standard GPO outlet. Jands GPO Series Field Plates have the connectors positioned to allow space for engraved labels.

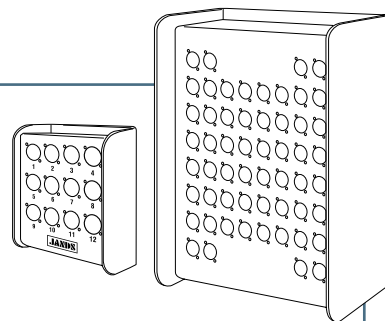


### Jands Stage Boxes

#### R' Type Stage Boxes

Suitable for installation and touring applications. The front panels are made from folded and punched 1.2mm steel with the bases made from 3mm thick aluminium. The boxes feature numerically labelled front panels.

Jands 'R' type stage boxes are suitable for use with Neutrik D connectors. Supplied with cable entry glands and rubber feet.



## Jands Equipment Racks

### Jands Racks

#### ReadyRack

Ready-to-go Equipment Racks targeted at AV Installers to reduce time and money, the ReadyRack is, as its name implies, READY to go. It arrives on-site boxed and ready to go with all the necessary accessories required for a quick, neat and efficient install.



### Jands Rack Accessories

#### Rack Mounting Prepunched Panels, Blank Panels, Shelves and Drawers

The range of rack mounting accessories feature solid construction with reinforced returns for extra strength.



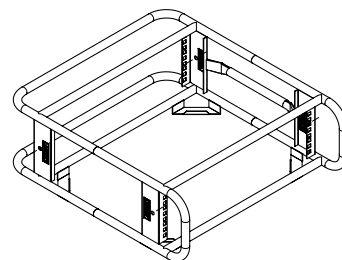
#### ProRack2

The new generation of Jands Professional Rack Range comes fully welded and bolted, finished in durable textured black powder-coat. Manufactured from 2mm Mild Steel, this rugged range of racks conforms to IEC 60297 standards.

### Jands Roobars

#### Roobar - Stackable

Equipment Rollcage. Designed to protect 19" rack mounted equipment. The design allows for unimpeded airflow and is a lightweight and tough alternative to wooden racks and sleeves. The frames can be used on their own or stacked, and feature an interlocking design to ensure stability.



Comms systems; as they are commonly known, are designed to allow technical staff within a venue to communicate discretely with each other during performances. Comms systems allow cues to be set and called to any lighting, sound or staging operator without disturbing the performance. Systems can be hard wired into a building or operate wirelessly for freedom of movement which can be extremely beneficial in outdoor performance or broadcast applications. Some systems can be run as a combination of wired and wireless providing the best of both worlds.

## Wired Systems

### Jands Party Line

#### Jands Ezicom

The Ezicom intercom system is designed to meet communication needs in contemporary stage productions, particularly where high ambient noise levels may be experienced. A basic system would consist of one E-400 or E-200 master station connected to a number of remote E-100/E300 substations.

Up to 20 remote substations can be connected to 1 master station and up to 100 remote substations may be run in a system using multiple master stations. The system uses standard screened microphone cable.

Audio levels remain constant when stations join or leave the line. Audio circuits are designed to give high intelligibility even in the presence of dimmer noise and strong RF fields.

#### The system components are:

E-100 Headset Sub Station, E-300 Speaker Sub Station, E-200 2 Channel Master Station, E-400 4 Channel Master Station.

- Compatible with Clear-Com Party Line systems



### Clear-Com Party Line

#### Clear-Com Encore™

Based upon Clear-Com's market-proven communication technology, Clear-Com Encore™ delivers improved audio performance and offers a independent multi channel operation.

All components are constructed and proven to withstand rugged usage in fast-paced, demanding and high intensity applications. Even under the most challenging conditions, the noise attenuating headsets and noise-cancelling microphones, combined with anti-sidetone circuitry, minimise acoustic noise and feedback to provide superior sound quality.



### ClearCom Eclipse Digital Matrix



#### Easi-PiCo Package (Up to 16 ports)

The Easi-PiCo package is pre-configured with 4 setups supporting 16 ports, a highly economical and low risk approach to evolve from a party-line system to a small scale point-to-point matrix system. Delivered as an entry-level matrix package, the Easi-PiCo solution includes a scaled down Eclipse PiCo frame, interface cards, power supply and choices of beltpacks and panel options. The Easi-PiCo 16 channel system does not require any software setup and offers a mix of nondisplay panels and interfaces. Easi-PiCo systems can be later expanded into a full 36-port Eclipse PiCo through an onsite software upgrade.

#### Eclipse PiCo (up to 36 ports)

Eclipse PiCo offers 36 full duplex communication ports, including four 4-wire ports, in a one-rack unit (1RU) chassis. Each Eclipse PiCo has two power supplies for fail-safe redundancy, and eight onboard general-purpose inputs and outputs. It supports V-Series, Istations, 4000 series panels and ICS panels. Eclipse PiCo is ideal for communication needs in small to mid-size production environments such as OB vans, studio and sports facilities.

#### Eclipse Omega (Up to 240 ports)

Eclipse Omega is the most advanced digital matrix intercom platform, offering up to 240 RJ-45 ports over 15 module slots in a 6-RU chassis – the highest port density of any available system on the market. Eclipse Omega is perfect for large scale communication productions with thousands of users located in multiple facilities. By connecting multiple Eclipse Omega matrices, up to 3120 users can be supported on a single networked platform. Each of the 15 slots can house 16-port matrix cards to provide full-duplex connections with panels, external lines, and interfaces to other matrix systems. The Omega can use the FreeSpeak® Integra integrated digital wireless cards.

#### Eclipse Median (Up to 112 ports)

The Eclipse Median is a 6RU frame that houses 2 CPU and 7 matrix slots with 8 built-in interface module slots, uniquely designed for outside broadcast vehicles, mobile flight-case systems, or any production environment where rack space is limited. Eclipse Median delivers up to 112 CAT-5 panel/4-wire ports with any combination of interface cards: CCI-22 Party line, FOR-22 4-wire / relay, RLY-6 relay output card or GPI-6 GPI input interface cards and soon an AES-6 Co-ax and Digital audio module.





## Wireless Systems

### ClearCom FreeSpeak® Wireless Systems

#### FreeSpeak®

FreeSpeak® uniquely blends digital matrix technology with a locally distributed wireless "network". FreeSpeak® operates license-free in the 1.9 GHz frequency band, free of interference with other wireless products such as PCs, talent microphones, IFB and in-ear monitors. To this capability, the system adds broad connectivity to party-line and digital matrix intercom systems. With FreeSpeak®, belt-pack-to-belt-pack, belt-pack-to-panel and group communication is finally possible within a wireless system in full duplex.

#### Features

- License-free 1.9 GHz DECT Operations
- 20 wireless belt-packs in 1RU (v2 and up)
- Point-to-point and small group wireless communications
- Up to 6 communications routes per belt-pack
- Frequency and channel hopping technology



#### FreeSpeak® Integra

FreeSpeak® Integra uses the same unique cellular autoroaming technology as FreeSpeak®.

This allows each belt-pack to continuously detect and automatically select the best connection to the matrix via the Active Antennas. Up to 40 belt-packs can be used with the Eclipse matrix systems, FreeSpeak® Integra uses a Cell Controller card, called EQue, fitted within the Eclipse matrix, achieving much larger wireless system than FreeSpeak®. Integra provides connectivity between the belt-packs and any number of ports within the matrix system, creating a true seamless environment. FreeSpeak® Integra operates using a cellular network of DECT 1.8-1.9GHz Active Antennae located around the production environment which are connected directly to the Clear-Com Eclipse matrix.

#### Features

- Cellular Architecture using low-cost Active Antennae
- Up to 40 users per Cell (depending on the environment)
- Up to 200 pre-set roles can be defined using system configuration software
- Up to 300 meters range under good conditions. Range can be extended by creating more cells (i.e. add additional Active Antennas)
- Cellular Roaming – users can freely roam between cells, no need for frequency agility or changing channels
- Patented DPA (Dynamic Port Allocation) technology select your position directly from the belt-pack and talk as you roam, the matrix keeps you connected
- Full duplex 7kHz 'commentator' bandwidth for high-clarity, fatigue-free communications
- Presenters or performers can also use FreeSpeak® Integra as an earpiece system
- Quick & easy programming of audio routes from the belt-pack or via standard software
- Seamlessly integrates with Eclipse Omega and Median

**STOP  
PRESS:**

New Clear-Com Tempest Wireless System available by time of print. Check CD for the new specs!

#### TECH-TIPS

#### What other systems is Clear-Com compatible with?

Clear-Com Party-Line products are compatible with Jands Ezicom as well as most other Party-line products and accessories on the market straight out of the box. Other forms (like TW or Two Wire) require interfaces or TW compatible products provided by Clear-Com. Third party headsets can also be used with the Clear-Com range, of which most are compatible. Some 3<sup>rd</sup> party headsets are sold with different connectors or just bare ends. These must be wired to suit the Clear-Com product line. All Clear-Com branded headsets are supplied pre-terminated ready to use.

#### Here are the standard pin outs for Clear-Com Party-Line products:

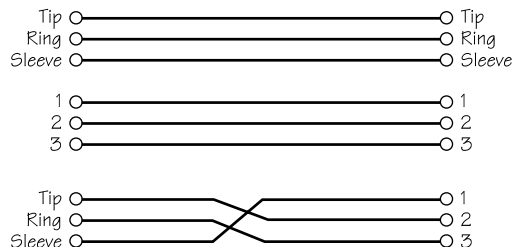
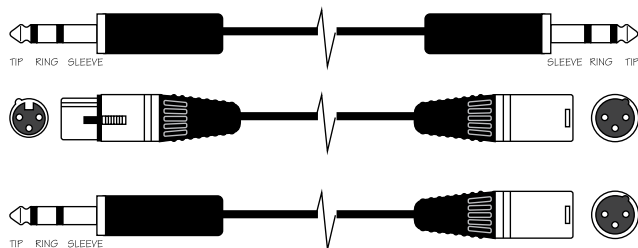
##### Party-Line:

- Pin 1 --- Ground (shield)
- Pin 2 --- Power
- Pin 3 --- Audio

##### Headset:

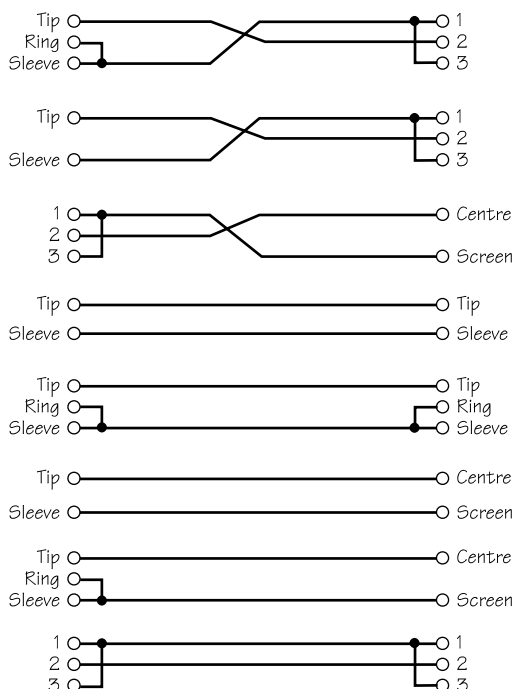
- Pin 1 --- Mic common
- Pin 2 --- Mic hot
- Pin 3 --- Headphone common
- Pin 4 --- Headphone hot

## Balanced



The diagrams illustrate the following connections:

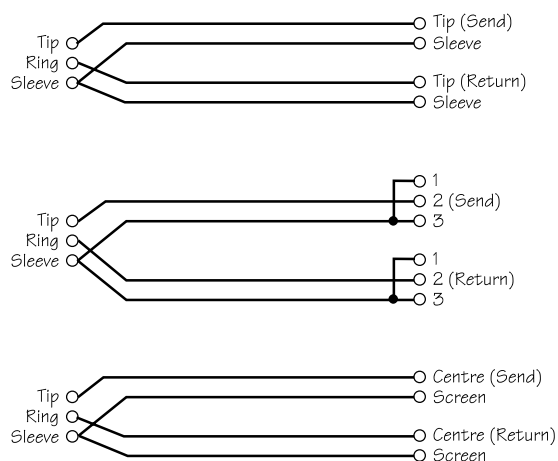
- Diagram 1:** TIP (left) to RING (right), SLEEVE (left) to TIP (right).
- Diagram 2:** TIP (left) to RING (right), SLEEVE (left) to RING (right).
- Diagram 3:** TIP (left) to RING (right), SLEEVE (left) to TIP (right).
- Diagram 4:** TIP (left) to RING (right), SLEEVE (left) to RING (right).
- Diagram 5:** TIP (left) to RING (right), SLEEVE (left) to TIP (right).
- Diagram 6:** TIP (left) to RING (right), SLEEVE (left) to RING (right).
- Diagram 7:** TIP (left) to RING (right), SLEEVE (left) to TIP (right).



### Port Leads

The diagram illustrates three types of port leads, each with a cross-section view of the connector and a corresponding cross-section of the port it connects to.

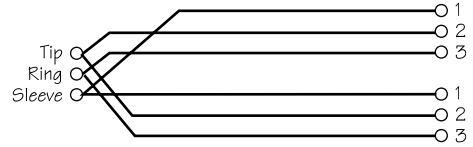
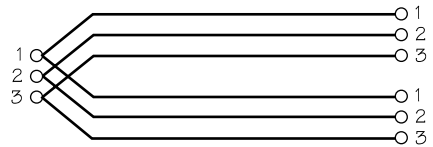
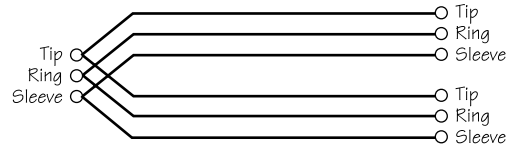
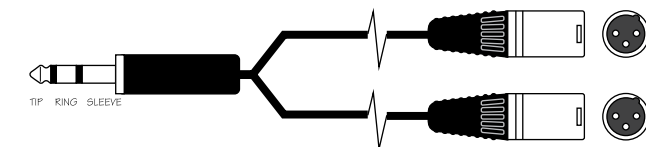
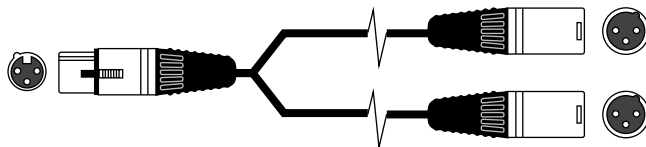
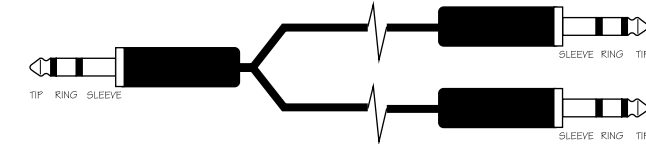
- Tip-Ring-Sleeve (TRS):** The lead has three conductors: Tip, Ring, and Sleeve. The cross-section shows a TRS connector with three contacts.
- Tip-Ring-Sleeve with Ground (TRRS):** The lead has four conductors: Tip, Ring, Sleeve, and Ground. The cross-section shows a TRRS connector with four contacts.
- Tip-Ring-Sleeve with Ground and Shield (TRRS+G):** The lead has five conductors: Tip, Ring, Sleeve, Ground, and Shield. The cross-section shows a TRRS+G connector with five contacts.



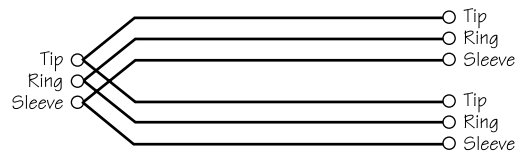
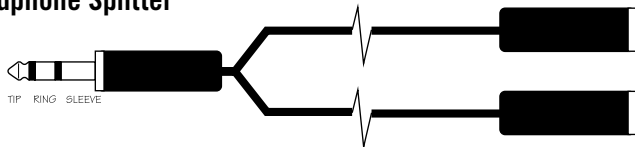
## Leads Inputs & Outputs Guide

### 'Y' Leads (Balanced)

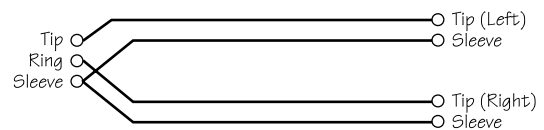
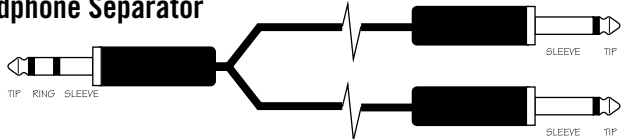
Where used....Aux, Mix outputs



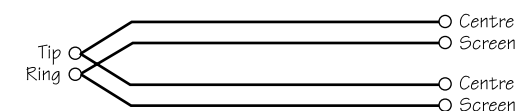
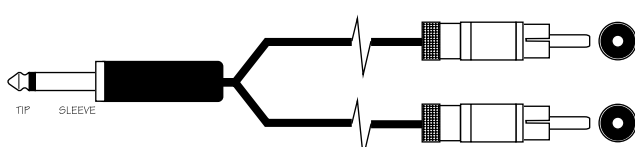
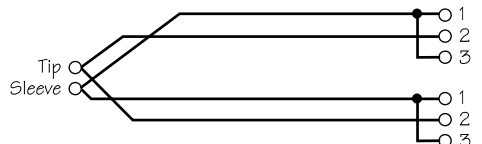
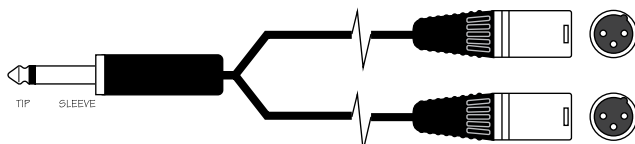
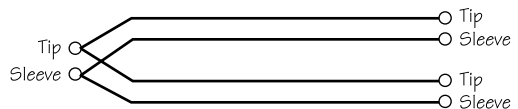
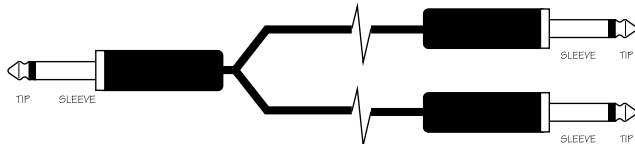
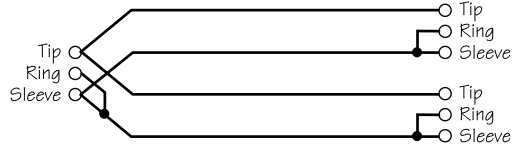
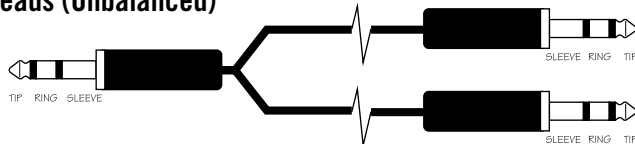
### Headphone Splitter



### Headphone Separator



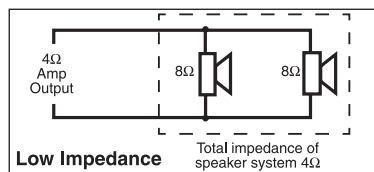
### 'Y' Leads (Unbalanced)



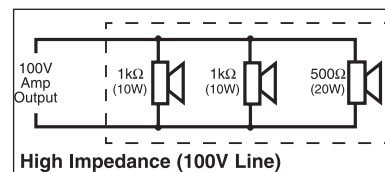


## Calculating Speaker Impedance

Where multiple speakers are connected it is important to maintain the correct impedance so as not to damage the amplifier. Most multimeters only measure resistance - impedance is different. Resistance is the measurement of DC current and the resistance to its flow, impedance is the measure of the resistance to flow of AC current, which varies with frequency. Typically an 8 ohm nominal impedance cone speaker has a DC resistance of 6 ohm. To measure impedance a dedicated meter is required, these use a 1k frequency the result of which should be cross referenced with the speaker's impedance chart to see what value should be expected.

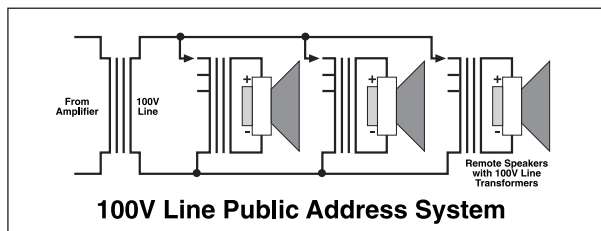
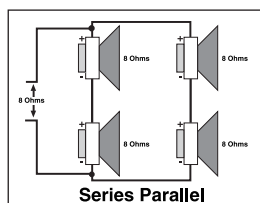
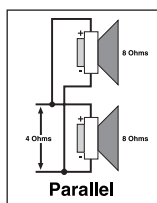
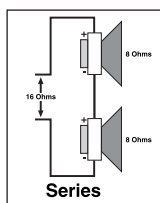


$$\frac{1}{\frac{1}{8\Omega} + \frac{1}{8\Omega}} = 4\Omega$$



$$\frac{1}{\frac{1}{1k\Omega} + \frac{1}{1k\Omega} + \frac{1}{500\Omega}} = 250\Omega (40W)$$

## Speaker Wiring Configurations



### Wiring Speakers In Series

Speakers in series double the nominal speaker impedance, ie. two 8Ω speakers become 16Ω. Typically used in band PA speaker boxes, nightclub speaker systems, DJ systems and car audio systems.

### Wiring Speakers In Parallel

Speakers in parallel halve the nominal speaker impedance, ie. two 8Ω speakers become 4Ω. Typically used in band PA speaker boxes, nightclub speaker systems, DJ's systems and car audio systems.

### Wiring Speakers In Series Parallel

Speakers wired in series parallel are used to maintain the same impedance as a single driver. ie four 8Ω speakers wired in this configuration represents an 8Ω load to the amplifier. This arrangement substantially increases the total SPL of the system compared to one single driver.

### Wiring Speakers In Parallel for 100V Line

Where several speakers are to be used at one time, on one circuit, it becomes necessary to use speakers fitted with line-matching transformers. This is to overcome the effects of connecting speakers in parallel and cable losses. The amplifier system generally has an output voltage of 100 volts. This is then applied to the speaker transformers. In this configuration the total wattage load on the amplifier is derived from adding all the line transformer primary tap ratings together. For example, 70 one watt speakers will have a total speaker load of 70 watts. Or alternatively, it is conceivable to connect 100 one watt speakers to a 100 watt, 100 volt line amplifier.

## Guide to IP Ratings

IP ratings are used to designate an object's resistance to environmental ingress. For example, our IP65 equipment enclosures are totally protected against dust ingress and low pressure water jets from all directions.

### General Guide to IP Ratings

The table below shows general descriptions for IP ratings. They are a guide only, for detailed information consult the relevant Australian Standard.

	First Digit	Second Digit
	Solid Object Ingress	Liquid Ingress
0	No protection	No protection
1	Protection against solid objects over 50mm eg. hands	Protection against vertically falling drops of water
2	Protected against solid objects over 12mm eg. fingers	Protected against direct sprays of water up to 15° from vertical
3	Protected against solid objects over 2.5mm eg. tools	Protected against sprays up to 60° from vertical
4	Protected against solid objects over 1mm eg. wires, tools	Protected against water sprayed from all directions Limited penetration permitted
5	Protected against dust limited penetration permitted (no harmful deposits)	Protected against low pressure jets of water from all directions Limited penetration permitted
6	Totally protected against dust. ie sealed	Protected against strong jet of water. Limited penetration permitted eg. marine environments
7		Protected against effects of immersion between 150mm and 1m
8		Protected against effects of continuous submersion at a specified depth

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